

APPENDIX 3.4-A, APPENDIX C: VIBRATION PROPAGATION MEASUREMENT DATA

Table C-1 Line Source Response Coefficients for Borehole Impact Site VP1—86 ft Depth

| Frequency (Hz) | A | B | C |
|----------------|--------|-------|-------|
| 3.15 | 14.1 | -10.3 | -4.1 |
| 4 | -160.2 | 153.8 | -41.8 |
| 5 | 15.9 | -4.7 | -4.3 |
| 6.3 | 105.1 | -45.6 | -2.4 |
| 8 | 88.5 | -36.1 | -2.8 |
| 10 | -205.5 | 232.7 | -63.3 |
| 12.5 | 22.8 | 10.4 | -9.4 |
| 16 | 41.2 | -9.1 | -4.1 |
| 20 | -58.5 | 89.7 | -29.2 |
| 25 | -62.7 | 100.6 | -33.3 |
| 31.5 | 110.0 | -44.9 | -2.4 |
| 40 | 85.2 | -35.9 | -2.8 |
| 50 | 116.8 | -51.5 | -2.1 |
| 63 | 71.7 | -30.0 | -3.1 |
| 80 | 62.1 | -25.0 | -3.4 |
| 100 | 62.0 | -25.6 | -3.3 |
| 125 | 83.5 | -38.9 | -2.7 |

Hz = hertz

$$LSR(d) = A + B * \text{Log}(d) + C * \text{Log}^2(d)$$

Where: A, B, C = Polynomial coefficients

d = Perpendicular and horizontal distance from track centerline (feet)

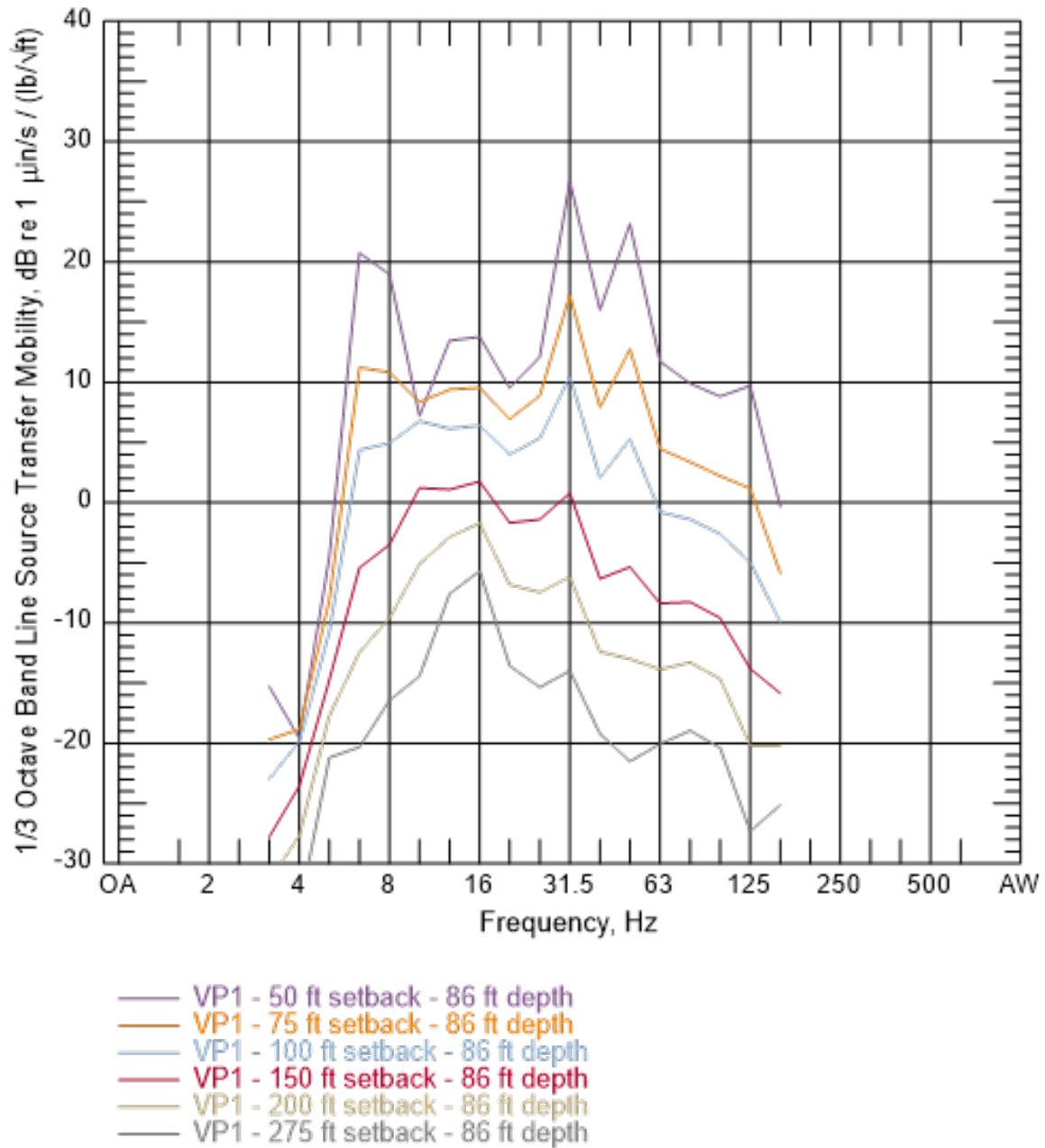


Figure C-1 Line Source Response for Borehole Impact Site VP1—86 ft Depth

Table C-2 Line Source Response Coefficients for Surface Impact Site VP2

| Frequency (Hz) | A | B | C |
|----------------|------|-------|---|
| 3.15 | 10.3 | 0.3 | 0 |
| 4 | 14.8 | -1.4 | 0 |
| 5 | 21.6 | -3.8 | 0 |
| 6.3 | 24.5 | -4.9 | 0 |
| 8 | 23.6 | -3.7 | 0 |
| 10 | 26.4 | -3.9 | 0 |
| 12.5 | 30.3 | -4.8 | 0 |
| 16 | 40.3 | -9.3 | 0 |
| 20 | 43.6 | -12.6 | 0 |
| 25 | 51.4 | -17.4 | 0 |
| 31.5 | 65.6 | -25.6 | 0 |
| 40 | 82.0 | -35.5 | 0 |
| 50 | 79.4 | -36.3 | 0 |
| 63 | 68.2 | -33.5 | 0 |
| 80 | 52.2 | -27.6 | 0 |
| 100 | 45.3 | -24.7 | 0 |
| 125 | 53.2 | -28.4 | 0 |

Hz = hertz

$$LSR(d) = A + B * \text{Log}(d) + C * \text{Log}^2(d)$$

Where: A, B, C = Polynomial coefficients

d = Perpendicular and horizontal distance from track centerline (feet)

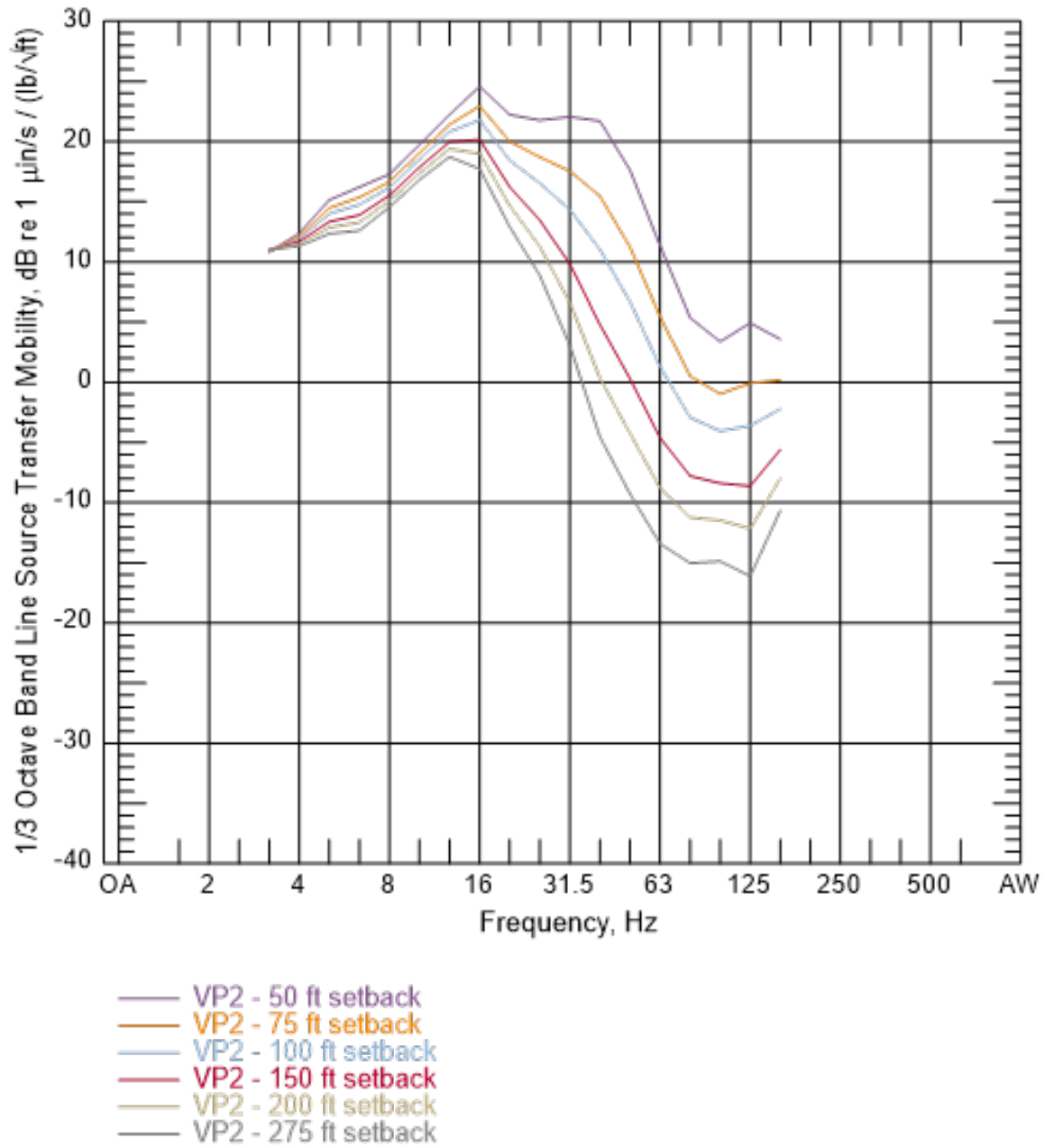


Figure C-2 Line Source Response for Surface Impact Site VP2

Table C-3 Line Source Response Coefficients for Borehole Impact Site VP3—0 ft Depth

| Frequency (Hz) | A | B | C |
|----------------|--------|-------|-------|
| 3.15 | 8.6 | 0.8 | -0.3 |
| 4 | -17.8 | 41.5 | -13.4 |
| 5 | 19.6 | 3.1 | -2.5 |
| 6.3 | 11.6 | 12.6 | -4.6 |
| 8 | 25.7 | 2.8 | -2.6 |
| 10 | -37.5 | 79.3 | -24.5 |
| 12.5 | -0.1 | 39.3 | -13.7 |
| 16 | 44.4 | -4.6 | -2.6 |
| 20 | 64.4 | -16.7 | -2.0 |
| 25 | -57.1 | 126.4 | -41.7 |
| 31.5 | 96.0 | -31.8 | -1.4 |
| 40 | -137.1 | 220.2 | -68.8 |
| 50 | 54.8 | 18.4 | -18.8 |
| 63 | 127.7 | -58.2 | -0.7 |
| 80 | 77.2 | -34.6 | -1.3 |
| 100 | 51.3 | -24.5 | -1.6 |
| 125 | 39.1 | -18.8 | -1.9 |

Hz = hertz

$$LSR(d) = A + B * \text{Log}(d) + C * \text{Log}^2(d)$$

Where: A, B, C = Polynomial coefficients

d = Perpendicular and horizontal distance from track centerline (feet)

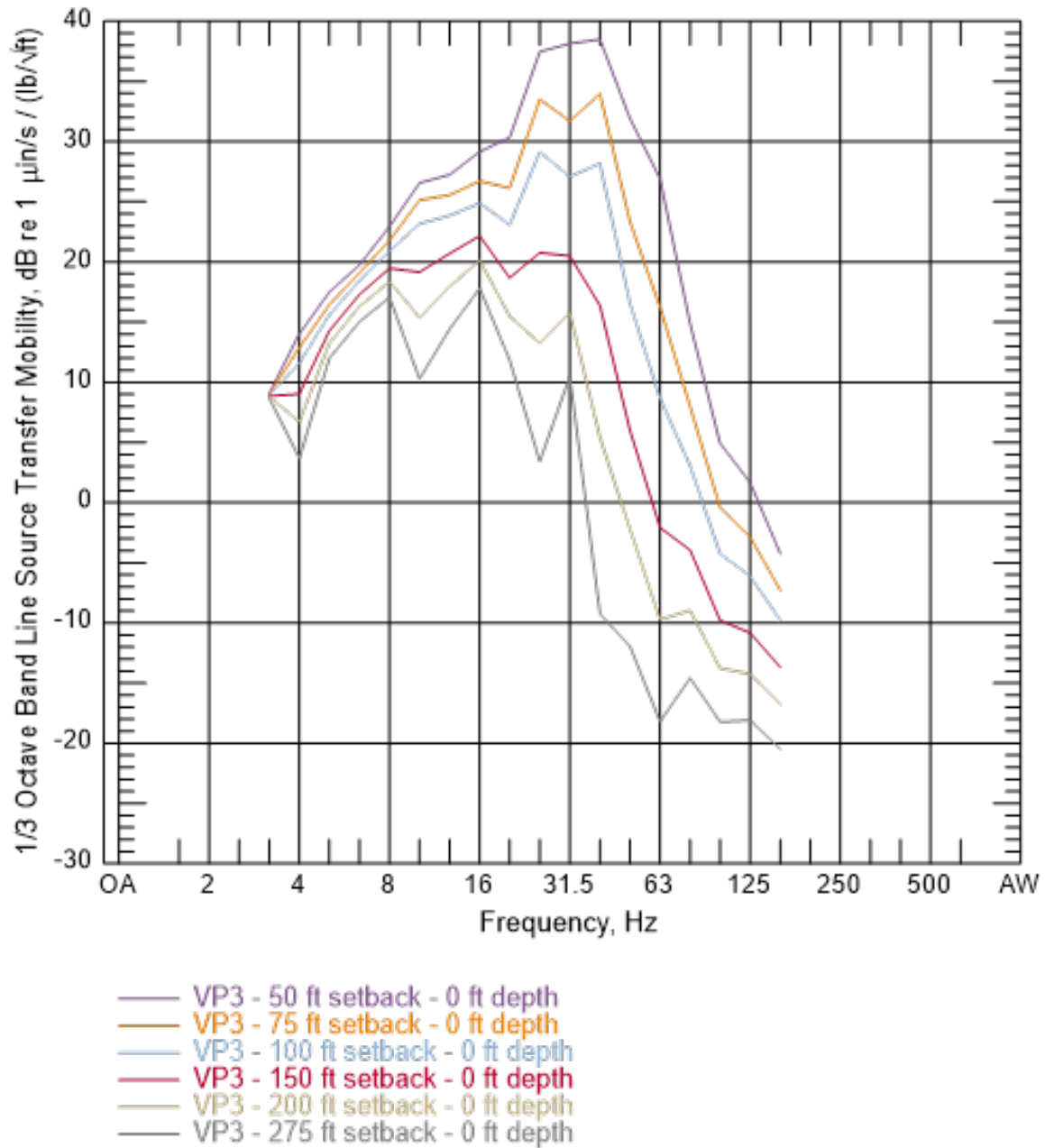


Figure C-3 Line Source Response for Borehole Impact Site VP3—0 ft Depth

Table C-4 Line Source Response Coefficients for Borehole Impact Site VP3—20 ft Depth

| Frequency (Hz) | A | B | C |
|----------------|-------|-------|-------|
| 3.15 | 5.0 | -1.8 | 0.6 |
| 4 | -47.4 | 70.4 | -21.1 |
| 5 | -36.8 | 62.7 | -18.2 |
| 6.3 | 13.0 | 12.6 | -5.3 |
| 8 | 22.7 | 4.2 | -2.8 |
| 10 | -77.4 | 116.7 | -33.7 |
| 12.5 | -35.0 | 74.7 | -23.4 |
| 16 | -4.1 | 47.9 | -18.3 |
| 20 | 55.2 | -15.4 | -2.4 |
| 25 | -44.9 | 93.8 | -30.9 |
| 31.5 | 80.6 | -27.6 | -1.8 |
| 40 | -4.3 | 59.3 | -24.4 |
| 50 | 22.6 | 31.0 | -18.4 |
| 63 | 46.5 | -14.9 | -2.4 |
| 80 | 61.2 | -28.0 | -1.8 |
| 100 | 22.1 | -11.4 | -2.6 |
| 125 | 4.1 | -2.7 | -3.0 |

Hz = hertz

$$LSR(d) = A + B * \text{Log}(d) + C * \text{Log}^2(d)$$

Where: A, B, C = Polynomial coefficients

d = Perpendicular and horizontal distance from track centerline (feet)

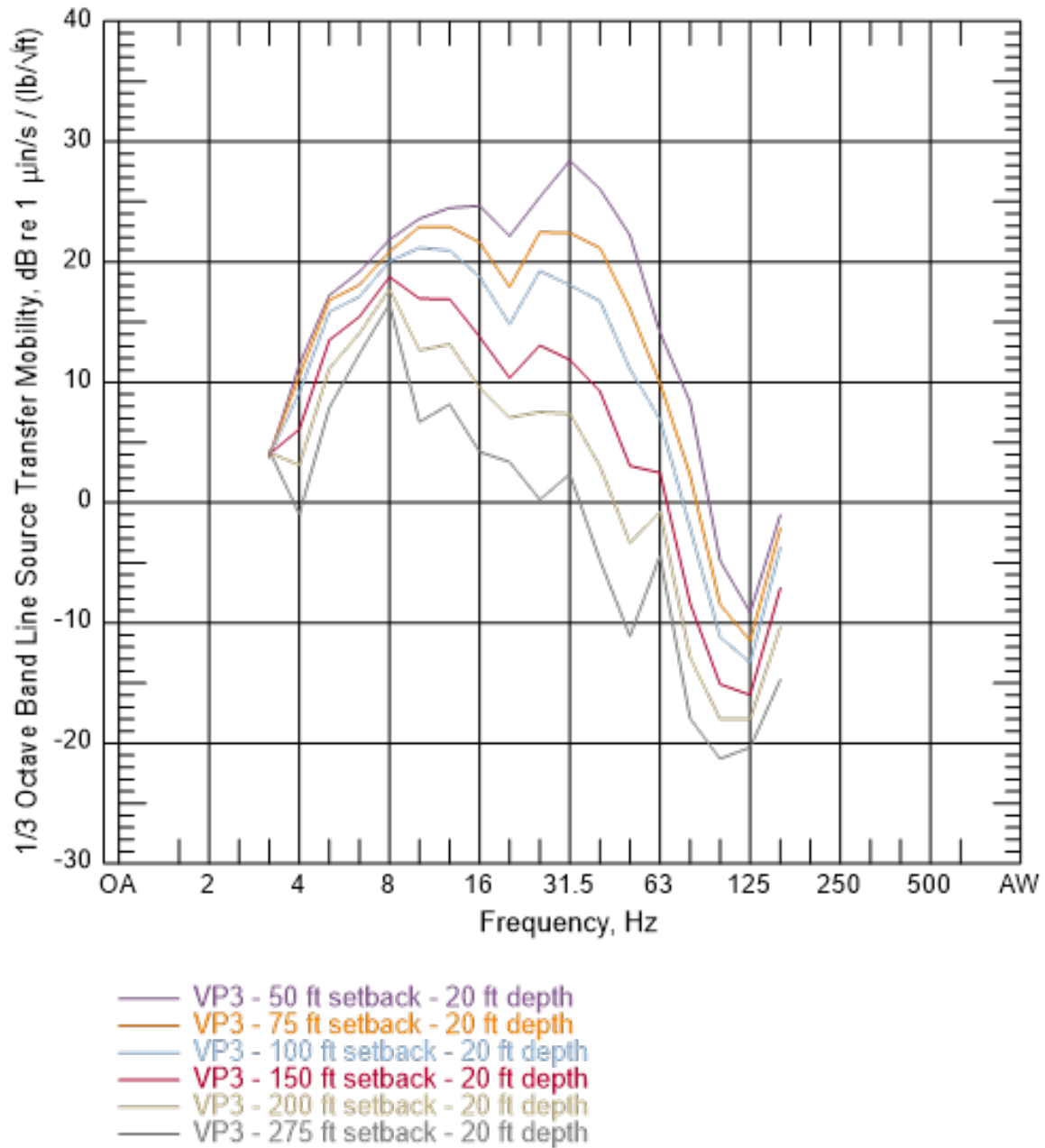


Figure C-4 Line Source Response for Borehole Impact Site VP3—20 ft Depth

Table C-5 Line Source Response Coefficients for Borehole Impact Site VP3—40 ft Depth

| Frequency (Hz) | A | B | C |
|----------------|--------|-------|-------|
| 3.15 | -27.3 | 36.2 | -9.8 |
| 4 | 6.0 | 5.4 | -2.6 |
| 5 | 14.4 | 5.3 | -2.5 |
| 6.3 | -69.0 | 96.3 | -26.4 |
| 8 | -66.8 | 95.8 | -26.2 |
| 10 | -5.7 | 36.0 | -11.9 |
| 12.5 | 25.9 | 3.3 | -3.4 |
| 16 | 32.2 | -0.6 | -3.4 |
| 20 | -6.1 | 40.5 | -14.2 |
| 25 | -145.8 | 193.3 | -54.5 |
| 31.5 | -181.4 | 233.6 | -65.7 |
| 40 | -177.3 | 227.4 | -64.0 |
| 50 | 88.4 | -36.2 | -1.8 |
| 63 | 23.0 | -2.3 | -3.4 |
| 80 | 20.0 | -7.7 | -3.2 |
| 100 | 34.8 | -14.7 | -2.8 |
| 125 | 36.3 | -14.4 | -2.8 |

Hz = hertz

$$LSR(d) = A + B * \text{Log}(d) + C * \text{Log}^2(d)$$

Where: A, B, C = Polynomial coefficients

d = Perpendicular and horizontal distance from track centerline (feet)

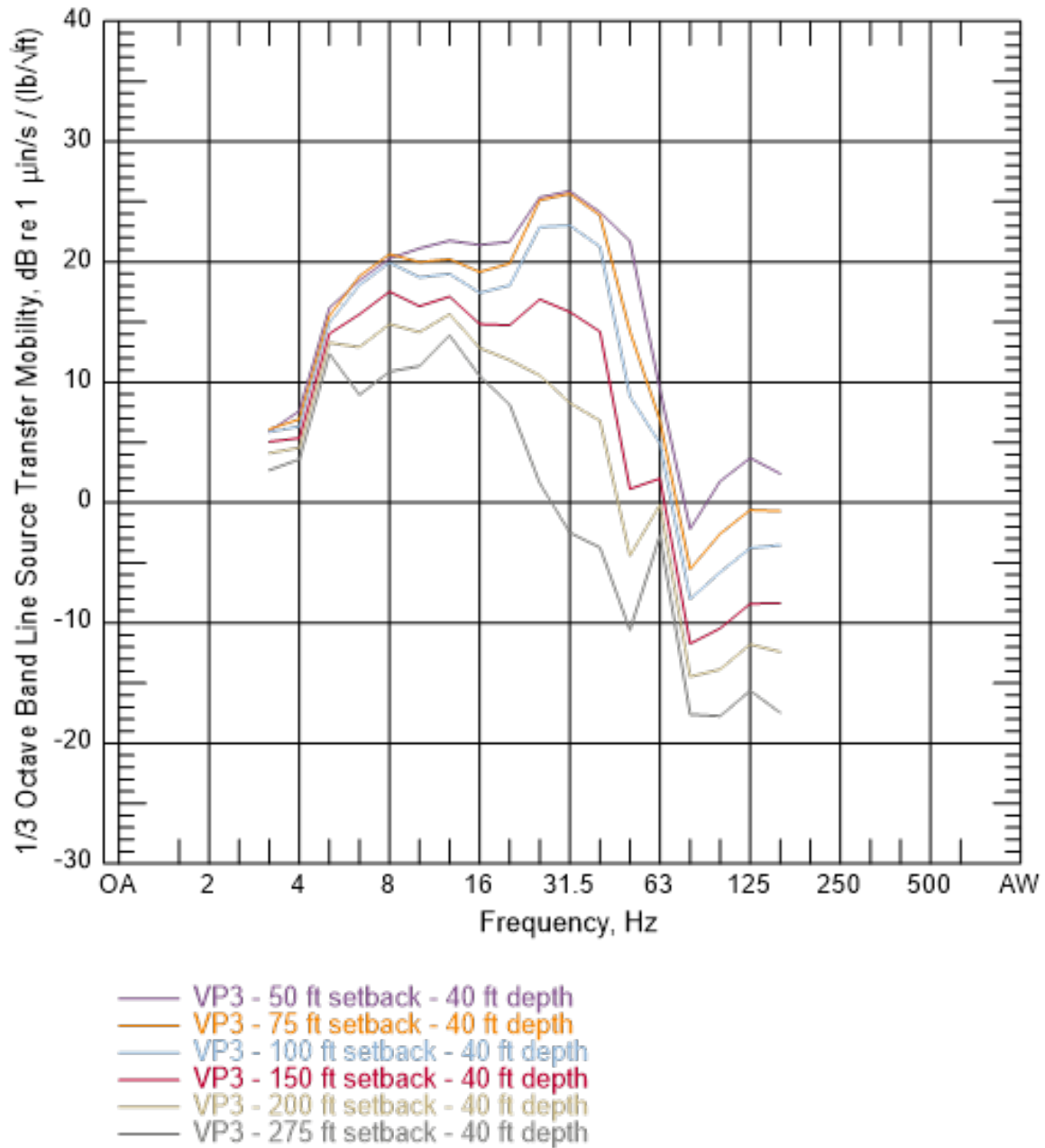


Figure C-5 Line Source Response for Borehole Impact Site VP3—40 ft Depth

Table C-6 Line Source Response Coefficients for Borehole Impact Site VP3—60 ft Depth

| Frequency (Hz) | A | B | C |
|----------------|--------|-------|-------|
| 3.15 | -32.7 | 37.5 | -9.6 |
| 4 | 7.6 | 6.1 | -3.3 |
| 5 | -97.4 | 113.7 | -29.2 |
| 6.3 | -199.5 | 218.2 | -55.9 |
| 8 | 17.0 | 5.2 | -3.6 |
| 10 | -70.8 | 92.2 | -24.3 |
| 12.5 | -9.5 | 31.1 | -9.3 |
| 16 | 25.3 | 2.2 | -3.9 |
| 20 | -236.4 | 262.1 | -67.8 |
| 25 | 50.3 | -10.8 | -3.5 |
| 31.5 | 49.6 | -11.2 | -3.5 |
| 40 | -141.4 | 168.1 | -45.6 |
| 50 | -5.4 | 43.9 | -18.6 |
| 63 | 47.8 | -14.7 | -3.3 |
| 80 | 64.0 | -25.9 | -2.7 |
| 100 | 61.0 | -25.9 | -2.7 |
| 125 | 50.2 | -20.7 | -3.0 |

Hz = hertz

$$LSR(d) = A + B * \text{Log}(d) + C * \text{Log}^2(d)$$

Where: A, B, C = Polynomial coefficients

d = Perpendicular and horizontal distance from track centerline (feet)

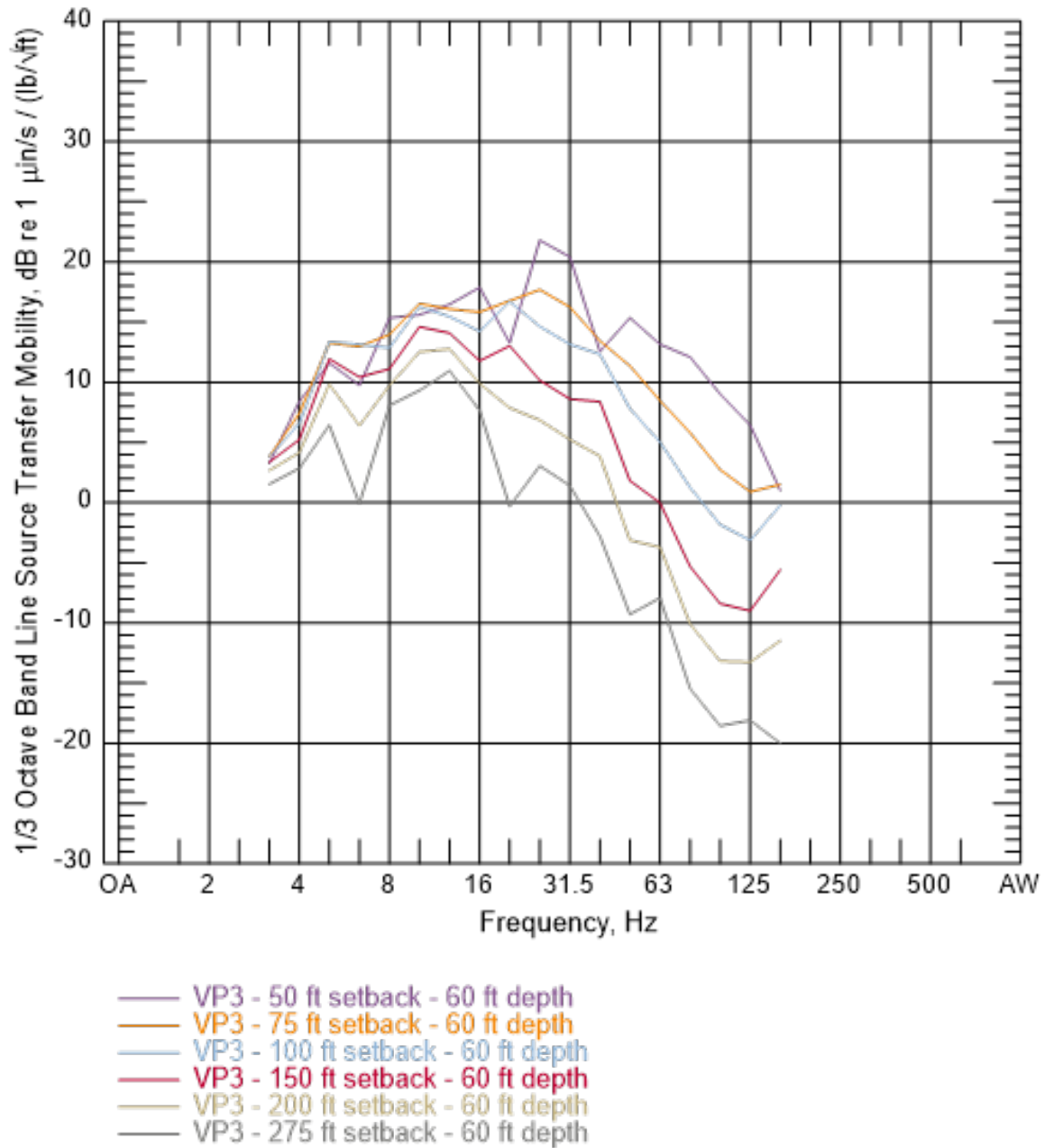


Figure C-6 Line Source Response for Borehole Impact Site VP3—60 ft Depth

Table C-7 Line Source Response Coefficients for Surface Impact Site VP4

| Frequency (Hz) | A | B | C |
|----------------|------|-------|---|
| 3.15 | 11.3 | -5.7 | 0 |
| 4 | 13.7 | -4.4 | 0 |
| 5 | 20.4 | -6.6 | 0 |
| 6.3 | 27.8 | -7.3 | 0 |
| 8 | 38.0 | -6.5 | 0 |
| 10 | 44.7 | -7.4 | 0 |
| 12.5 | 49.1 | -9.7 | 0 |
| 16 | 53.4 | -12.2 | 0 |
| 20 | 58.7 | -15.6 | 0 |
| 25 | 65.8 | -19.7 | 0 |
| 31.5 | 77.9 | -26.8 | 0 |
| 40 | 87.7 | -35.0 | 0 |
| 50 | 92.0 | -41.0 | 0 |
| 63 | 82.7 | -39.3 | 0 |
| 80 | 63.6 | -33.0 | 0 |
| 100 | 52.4 | -29.0 | 0 |
| 125 | 28.8 | -14.6 | 0 |

Hz = hertz

$$LSR(d) = A + B * \text{Log}(d) + C * \text{Log}^2(d)$$

Where: A, B, C = Polynomial coefficients

d = Perpendicular and horizontal distance from track centerline (feet)

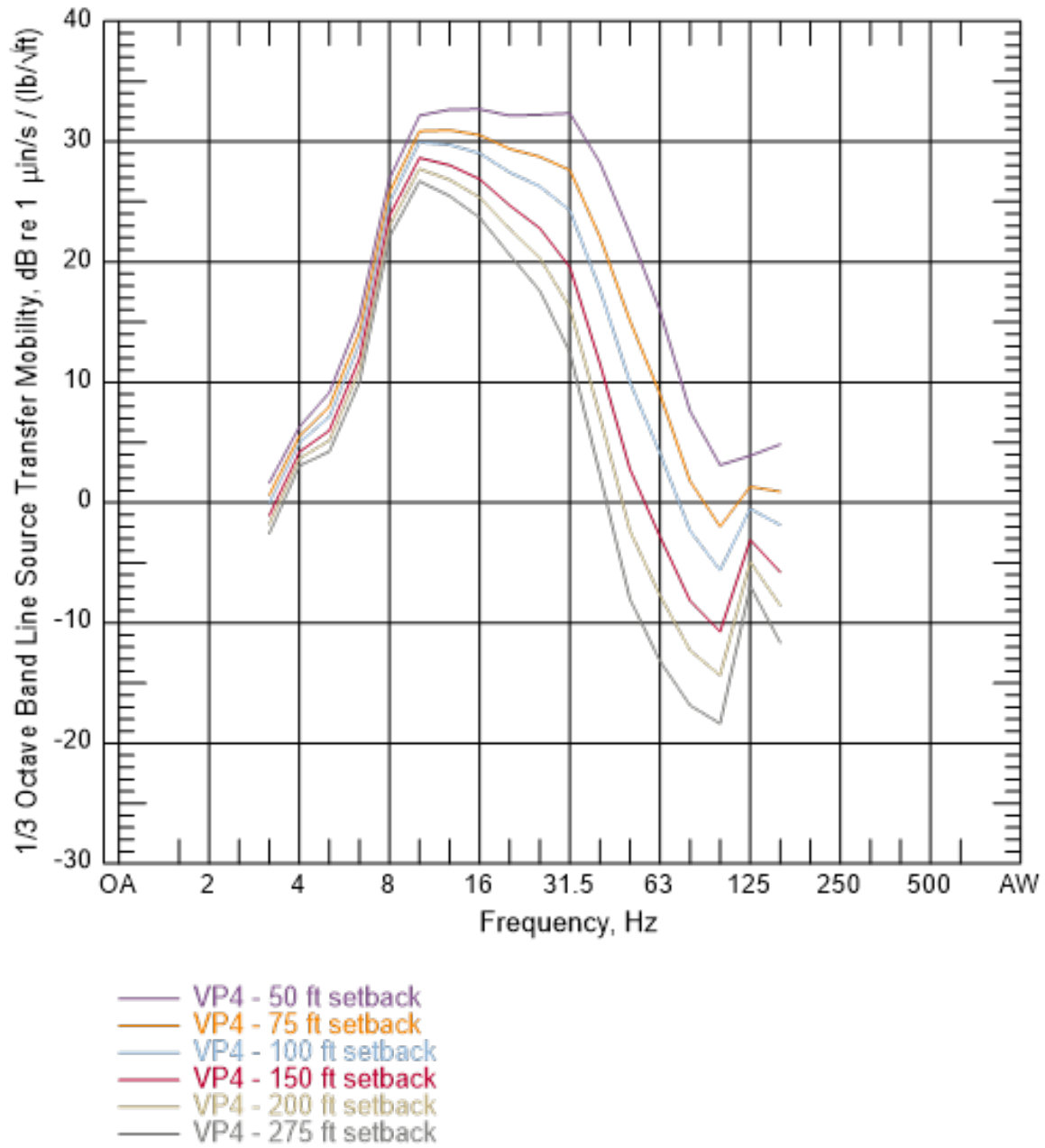


Figure C-7 Line Source Response for Surface Impact Site VP4

Table C-8 Line Source Response Coefficients for Borehole Impact Site VP5—0 ft Depth

| Frequency (Hz) | A | B | C |
|----------------|------|-------|-------|
| 3.15 | 5.4 | 2.3 | -2.7 |
| 4 | 10.9 | 1.9 | -2.7 |
| 5 | 16.3 | 3.8 | -2.3 |
| 6.3 | 22.7 | 2.5 | -2.6 |
| 8 | 22.8 | 3.5 | -2.5 |
| 10 | 23.5 | 3.8 | -1.9 |
| 12.5 | 19.5 | 8.2 | -2.8 |
| 16 | 6.4 | 23.9 | -7.5 |
| 20 | 22.1 | 3.3 | -1.5 |
| 25 | 47.8 | -8.7 | -2.4 |
| 31.5 | 49.2 | 7.9 | -11.6 |
| 40 | 87.2 | -33.5 | -1.3 |
| 50 | 80.3 | -31.8 | -1.3 |
| 63 | 89.0 | -40.6 | -1.1 |
| 80 | 84.2 | -38.2 | -1.1 |
| 100 | 69.0 | -32.7 | -1.3 |
| 125 | 63.4 | -33.3 | -1.3 |

Hz = hertz

$$LSR(d) = A + B * \text{Log}(d) + C * \text{Log}^2(d)$$

Where: A, B, C = Polynomial coefficients

d = Perpendicular and horizontal distance from track centerline (feet)

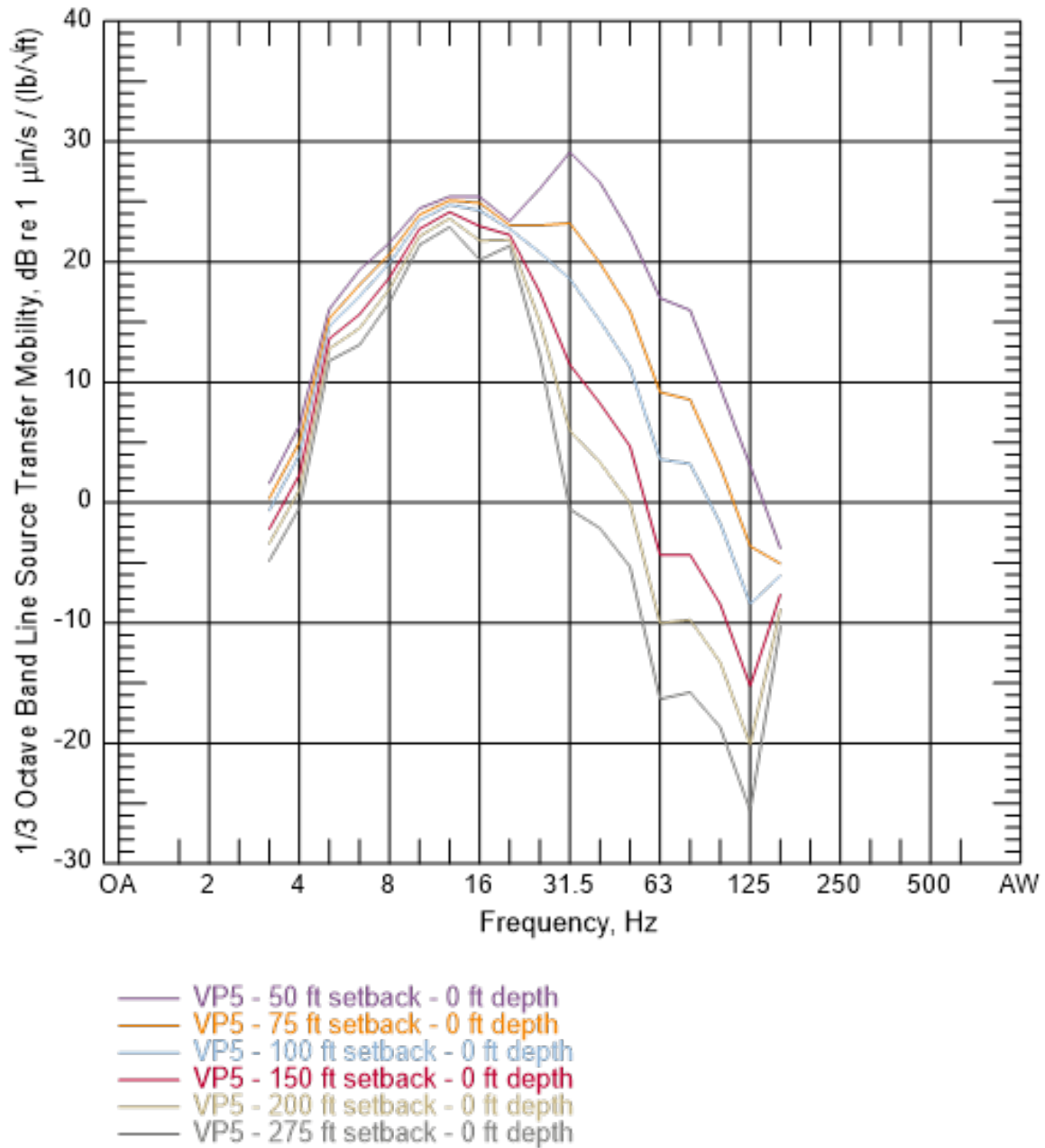


Figure C-8 Line Source Response for Borehole Impact Site VP5—0 ft Depth

Table C-9 Line Source Response Coefficients for Borehole Impact Site VP5—30 ft Depth

| Frequency (Hz) | A | B | C |
|----------------|--------|-------|-------|
| 3.15 | 2.4 | 0.6 | -0.2 |
| 4 | 6.3 | 4.7 | -2.2 |
| 5 | -25.1 | 50.9 | -15.1 |
| 6.3 | -17.2 | 46.9 | -14.4 |
| 8 | -9.7 | 43.4 | -13.9 |
| 10 | 27.5 | 4.0 | -3.0 |
| 12.5 | 27.5 | 3.7 | -3.0 |
| 16 | 29.4 | 1.3 | -3.2 |
| 20 | 38.1 | -4.3 | -3.0 |
| 25 | 53.3 | -12.2 | -2.7 |
| 31.5 | 52.4 | -11.0 | -2.7 |
| 40 | 64.2 | -17.0 | -2.4 |
| 50 | 47.3 | 5.4 | -11.1 |
| 63 | -125.9 | 173.9 | -53.2 |
| 80 | -42.8 | 77.6 | -26.9 |
| 100 | -129.8 | 179.0 | -55.6 |
| 125 | -175.5 | 216.7 | -63.4 |

Hz = hertz

$$LSR(d) = A + B * \text{Log}(d) + C * \text{Log}^2(d)$$

Where: A, B, C = Polynomial coefficients

d = Perpendicular and horizontal distance from track centerline (feet)

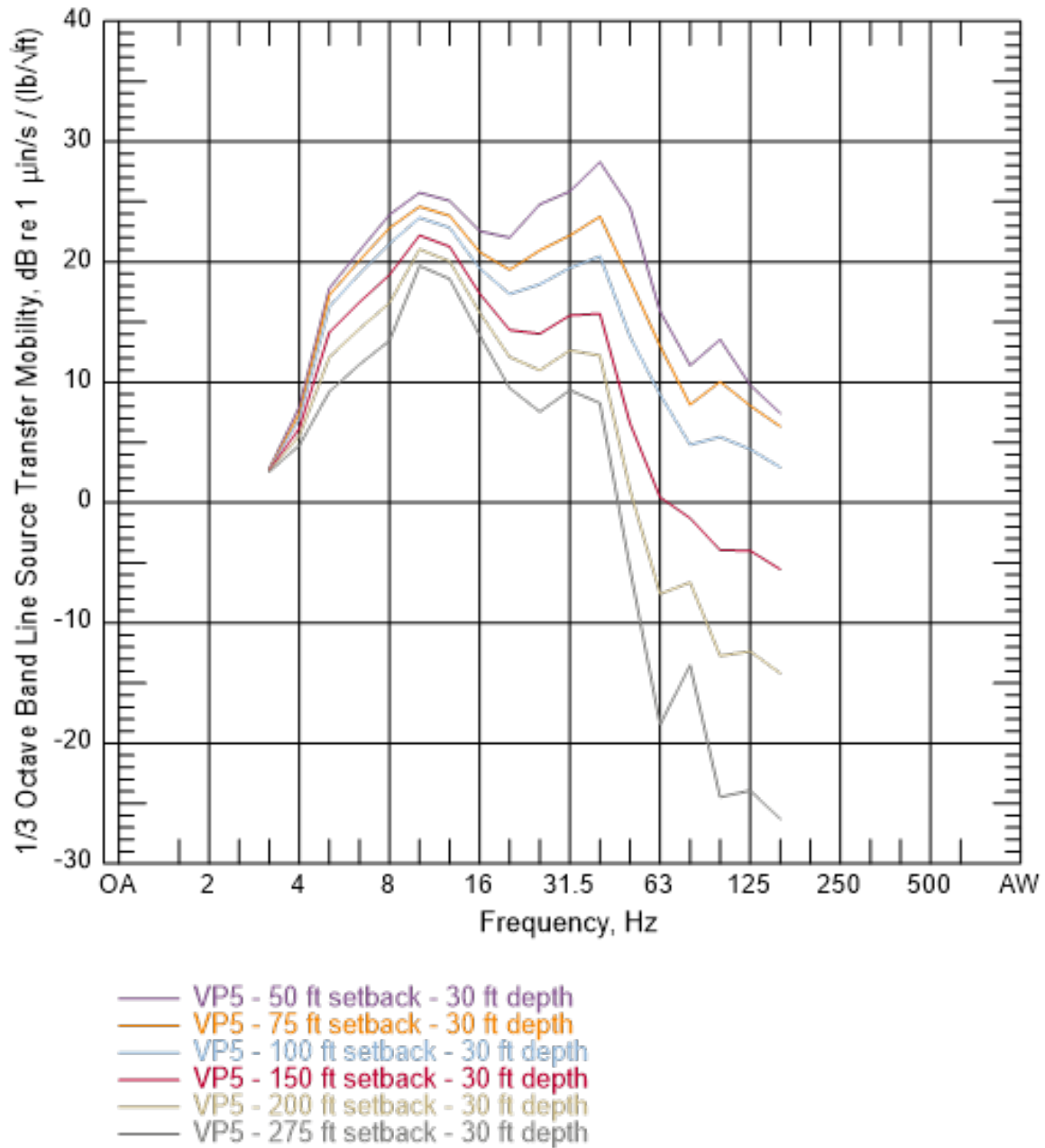


Figure C-9 Line Source Response for Borehole Impact Site VP5—30 ft Depth

Table C-10 Line Source Response Coefficients for Borehole Impact Site VP5—40 ft Depth

| Frequency (Hz) | A | B | C |
|----------------|--------|-------|-------|
| 3.15 | 0.3 | 5.2 | -2.4 |
| 4 | 16.9 | 0.3 | -3.4 |
| 5 | 14.8 | 5.4 | -2.8 |
| 6.3 | 12.6 | 12.5 | -5.2 |
| 8 | 14.1 | 14.1 | -5.8 |
| 10 | 1.1 | 30.9 | -10.8 |
| 12.5 | 33.1 | -0.4 | -3.4 |
| 16 | 37.5 | -3.8 | -3.3 |
| 20 | 45.0 | -9.8 | -3.1 |
| 25 | 42.0 | -7.3 | -3.2 |
| 31.5 | -22.8 | 60.4 | -19.6 |
| 40 | -198.5 | 250.5 | -70.1 |
| 50 | -278.8 | 335.9 | -94.0 |
| 63 | -228.4 | 274.5 | -77.4 |
| 80 | 75.9 | -31.3 | -2.0 |
| 100 | 74.7 | -18.0 | -8.3 |
| 125 | 104.4 | -46.6 | -1.4 |

Hz = hertz

$$LSR(d) = A + B * \text{Log}(d) + C * \text{Log}^2(d)$$

Where: A, B, C = Polynomial coefficients

d = Perpendicular and horizontal distance from track centerline (feet)

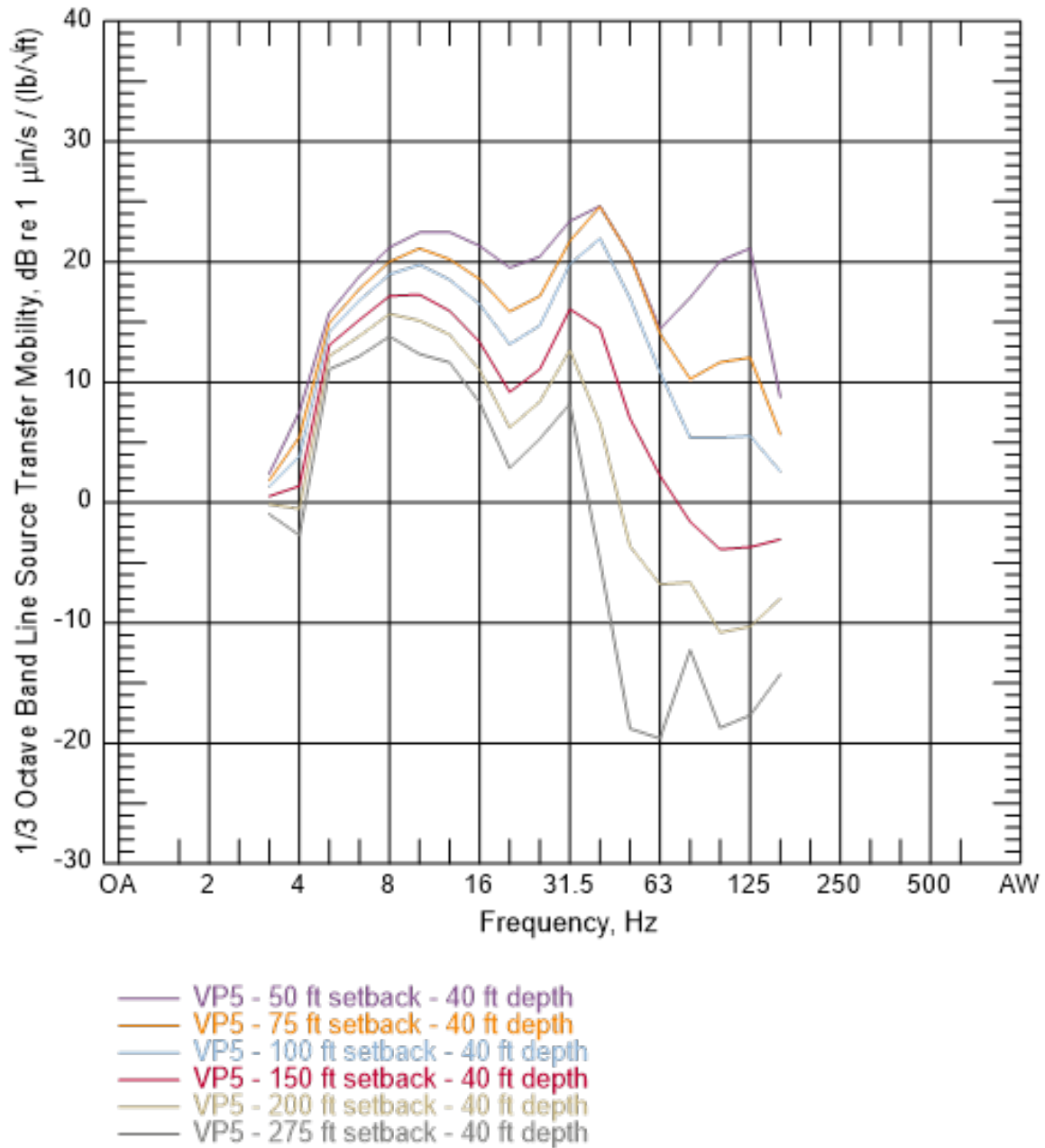


Figure C-10 Line Source Response for Borehole Impact Site VP5—40 ft Depth

Table C-11 Line Source Response Coefficients for Borehole Impact Site VP5—50 ft Depth

| Frequency (Hz) | A | B | C |
|----------------|--------|-------|--------|
| 3.15 | 2.7 | -3.0 | 1.0 |
| 4 | 4.5 | 0.7 | -0.3 |
| 5 | 13.3 | 5.8 | -2.8 |
| 6.3 | -52.4 | 74.5 | -20.4 |
| 8 | -103.6 | 134.4 | -37.1 |
| 10 | -22.4 | 54.4 | -17.1 |
| 12.5 | 36.9 | -2.8 | -3.6 |
| 16 | 44.2 | -7.4 | -3.4 |
| 20 | 58.9 | -17.3 | -2.9 |
| 25 | -105.4 | 147.8 | -43.5 |
| 31.5 | -202.3 | 240.5 | -64.4 |
| 40 | -301.9 | 344.0 | -91.3 |
| 50 | -12.4 | 54.1 | -20.3 |
| 63 | -337.5 | 375.4 | -101.5 |
| 80 | -81.3 | 121.2 | -39.6 |
| 100 | 39.0 | 8.1 | -13.6 |
| 125 | 106.3 | -50.5 | -1.5 |

Hz = hertz

$$LSR(d) = A + B * \text{Log}(d) + C * \text{Log}^2(d)$$

Where: A, B, C = Polynomial coefficients

d = Perpendicular and horizontal distance from track centerline (feet)

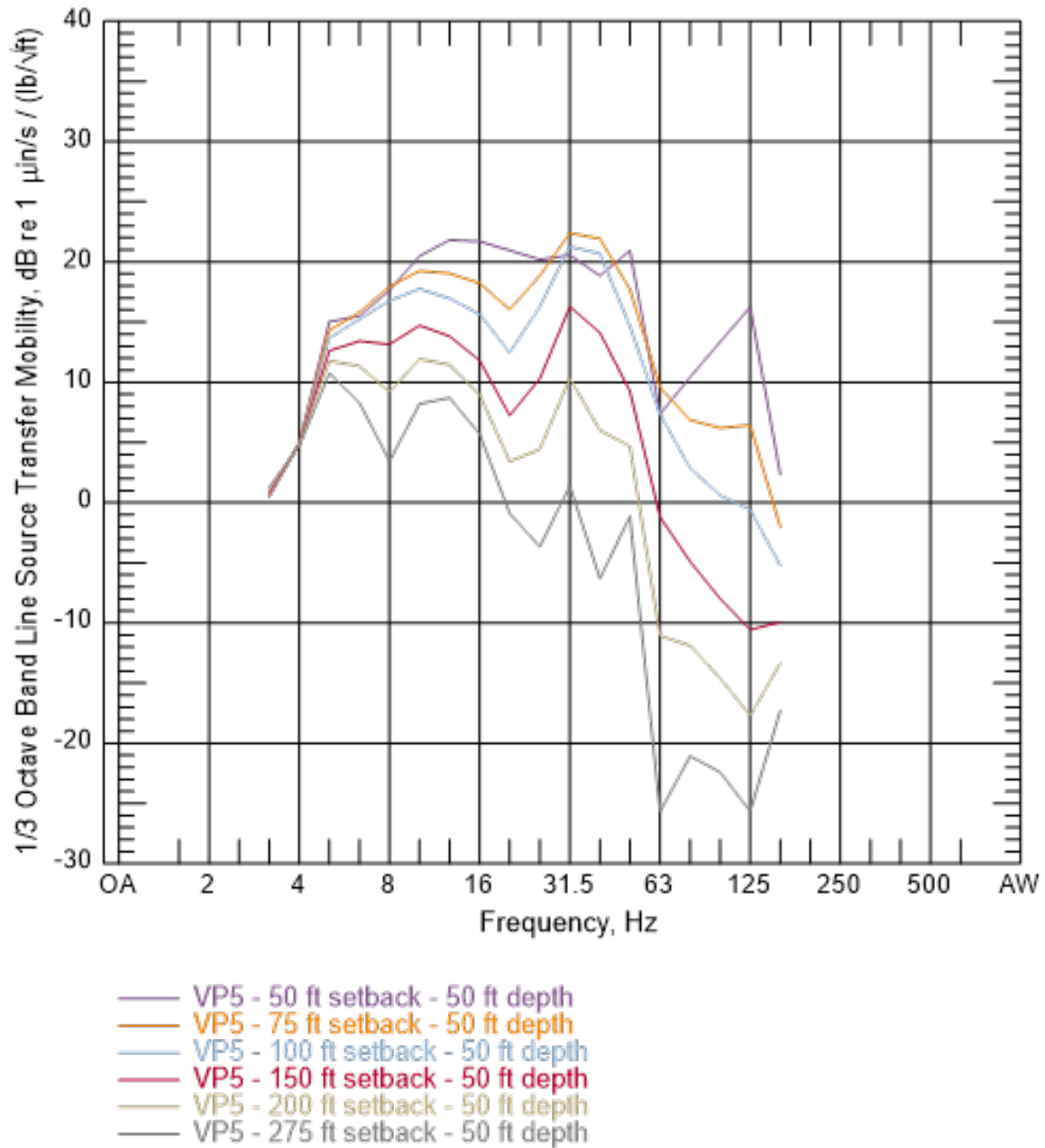


Figure C-11 Line Source Response for Borehole Impact Site VP5—50 ft Depth

Table C-12 Line Source Response Coefficients for Borehole Impact Site VP5—60 ft Depth

| Frequency (Hz) | A | B | C |
|----------------|-------|-------|-------|
| 3.15 | -17.3 | 32.3 | -12.0 |
| 4 | 2.5 | 5.3 | -2.2 |
| 5 | 8.8 | 6.2 | -2.9 |
| 6.3 | 14.3 | 5.8 | -3.4 |
| 8 | 12.6 | 6.1 | -3.3 |
| 10 | 25.4 | 1.8 | -3.9 |
| 12.5 | 18.9 | 5.2 | -3.6 |
| 16 | 20.8 | 3.8 | -3.8 |
| 20 | 43.1 | -9.7 | -3.6 |
| 25 | 38.0 | -6.1 | -3.7 |
| 31.5 | 37.2 | -3.8 | -3.8 |
| 40 | 31.5 | -0.9 | -3.9 |
| 50 | -87.3 | 112.0 | -31.1 |
| 63 | -14.5 | 46.6 | -18.3 |
| 80 | 37.3 | -10.8 | -3.5 |
| 100 | 46.3 | -16.7 | -3.2 |
| 125 | 45.3 | -16.5 | -3.2 |

Hz = hertz

$$LSR(d) = A + B * \text{Log}(d) + C * \text{Log}^2(d)$$

Where: A, B, C = Polynomial coefficients

d = Perpendicular and horizontal distance from track centerline (feet)

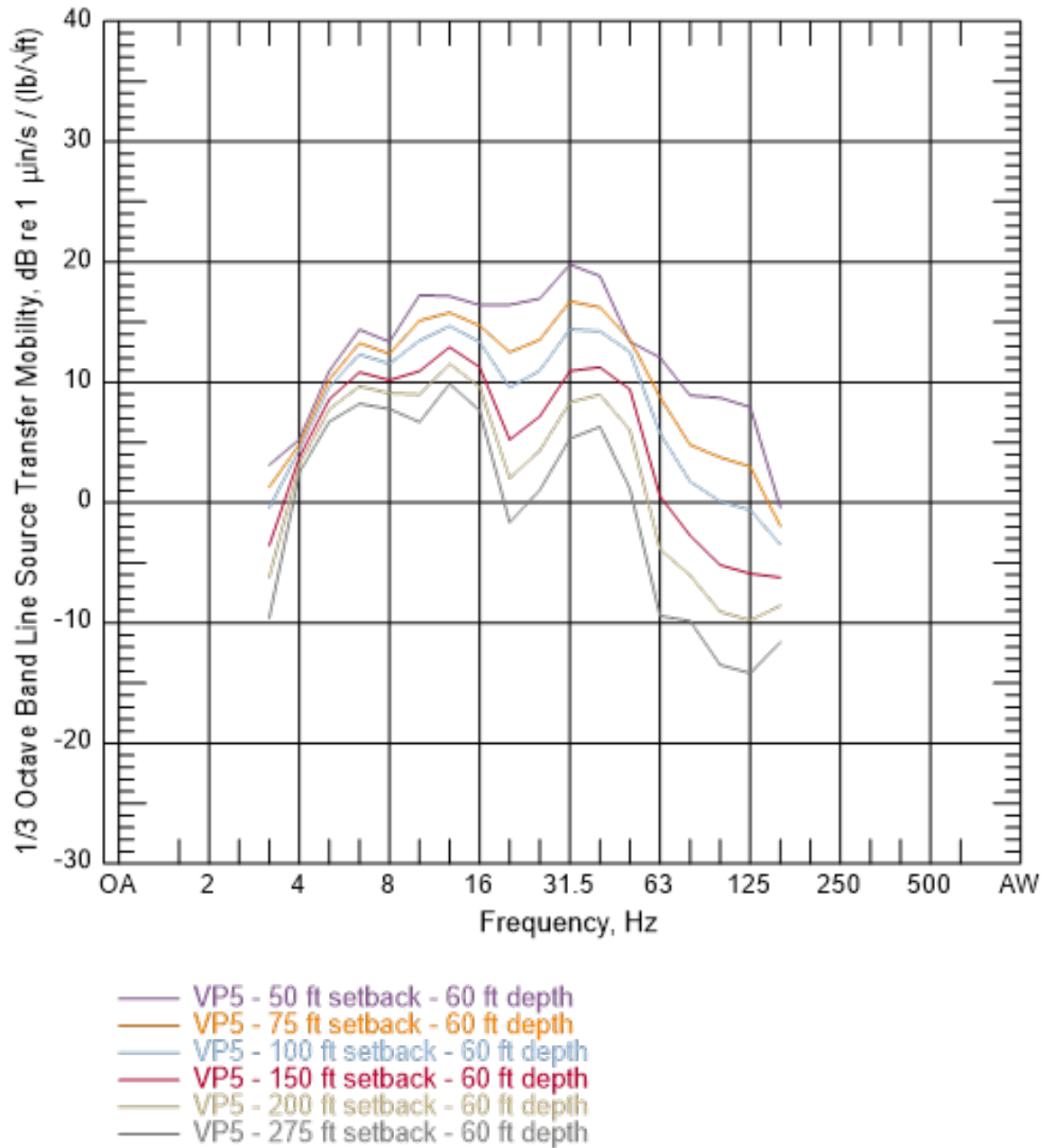


Figure C-12 Line Source Response for Borehole Impact Site VP5—60 ft Depth

Table C-13 Line Source Response Coefficients for Surface Impact Site VP6

| Frequency (Hz) | A | B | C |
|----------------|-------|-------|---|
| 3.15 | -6.1 | -0.4 | 0 |
| 4 | -0.8 | -0.2 | 0 |
| 5 | 13.3 | -3.1 | 0 |
| 6.3 | 26.6 | -6.4 | 0 |
| 8 | 42.2 | -12.2 | 0 |
| 10 | 46.9 | -13.7 | 0 |
| 12.5 | 48.3 | -13.6 | 0 |
| 16 | 45.8 | -12.5 | 0 |
| 20 | 57.9 | -18.3 | 0 |
| 25 | 79.8 | -28.7 | 0 |
| 31.5 | 111.0 | -44.5 | 0 |
| 40 | 91.8 | -37.7 | 0 |
| 50 | 88.9 | -41.6 | 0 |
| 63 | 64.7 | -34.4 | 0 |
| 80 | 27.6 | -17.2 | 0 |
| 100 | 27.3 | -16.2 | 0 |
| 125 | 25.9 | -15.4 | 0 |

Hz = hertz

$$LSR(d) = A + B * \text{Log}(d) + C * \text{Log}^2(d)$$

Where: A, B, C = Polynomial coefficients

d = Perpendicular and horizontal distance from track centerline (feet)

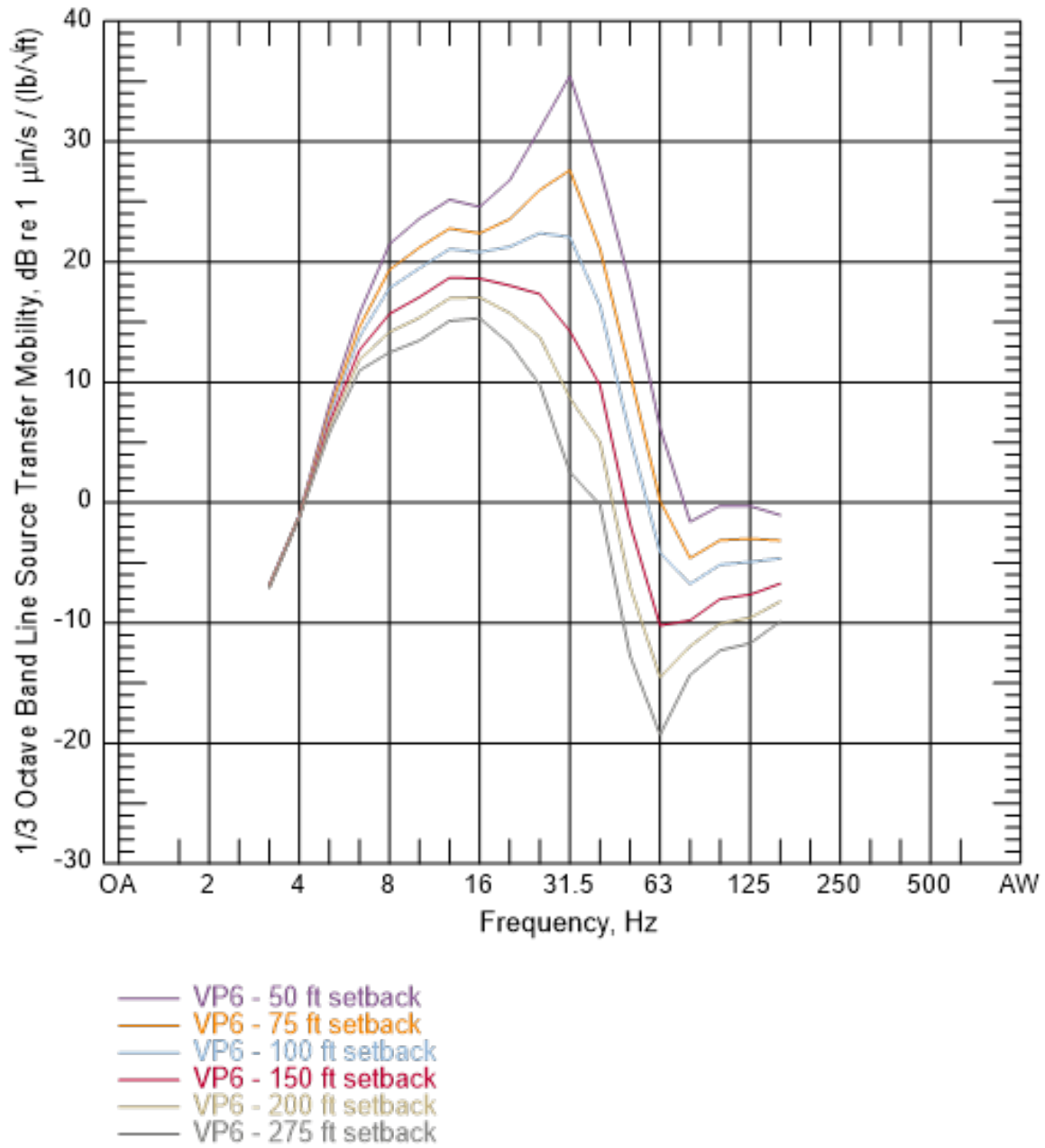


Figure C-13 Line Source Response for Surface Impact Site VP6

Table C-14 Line Source Response Coefficients for Surface Impact Site VP7

| Frequency (Hz) | A | B | C |
|----------------|-------|-------|---|
| 3.15 | 7.0 | -18.2 | 0 |
| 4 | -7.0 | -9.5 | 0 |
| 5 | 9.5 | -15.0 | 0 |
| 6.3 | 18.2 | -16.1 | 0 |
| 8 | 33.7 | -21.9 | 0 |
| 10 | 42.3 | -21.3 | 0 |
| 12.5 | 56.6 | -25.2 | 0 |
| 16 | 82.7 | -35.8 | 0 |
| 20 | 73.7 | -30.4 | 0 |
| 25 | 83.3 | -33.2 | 0 |
| 31.5 | 103.8 | -44.9 | 0 |
| 40 | 112.3 | -49.5 | 0 |
| 50 | 110.5 | -51.4 | 0 |
| 63 | 120.3 | -60.8 | 0 |
| 80 | 103.8 | -54.5 | 0 |
| 100 | 88.3 | -48.6 | 0 |
| 125 | 75.8 | -44.8 | 0 |

Hz = hertz

$$LSR(d) = A + B * \text{Log}(d) + C * \text{Log}^2(d)$$

Where: A, B, C = Polynomial coefficients

d = Perpendicular and horizontal distance from track centerline (feet)

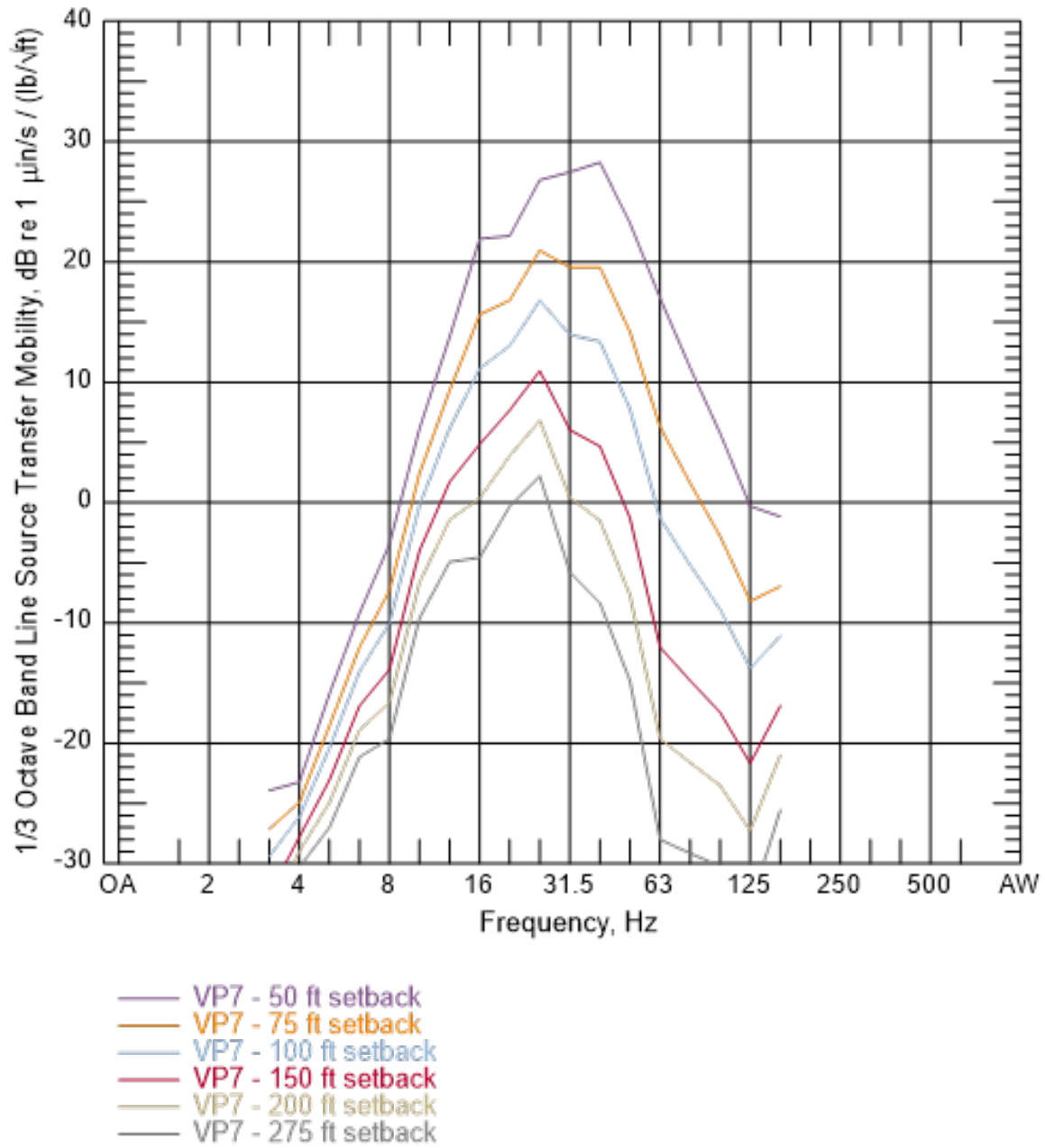


Figure C-14 Line Source Response for Surface Impact Site VP7

Table C-15 Line Source Response Coefficients for Surface Impact Site VP8

| Frequency (Hz) | A | B | C |
|----------------|-------|-------|---|
| 3.15 | 42.7 | -13.9 | 0 |
| 4 | 44.8 | -14.4 | 0 |
| 5 | 43.6 | -13.2 | 0 |
| 6.3 | 39.3 | -10.3 | 0 |
| 8 | 35.2 | -6.7 | 0 |
| 10 | 39.5 | -8.2 | 0 |
| 12.5 | 52.0 | -13.7 | 0 |
| 16 | 67.0 | -20.5 | 0 |
| 20 | 83.6 | -27.6 | 0 |
| 25 | 103.4 | -37.4 | 0 |
| 31.5 | 121.2 | -48.6 | 0 |
| 40 | 134.8 | -58.0 | 0 |
| 50 | 124.2 | -55.9 | 0 |
| 63 | 93.4 | -44.0 | 0 |
| 80 | 62.8 | -29.6 | 0 |
| 100 | 56.6 | -27.1 | 0 |
| 125 | 46.9 | -21.9 | 0 |

Hz = hertz

$$LSR(d) = A + B * \text{Log}(d) + C * \text{Log}^2(d)$$

Where: A, B, C = Polynomial coefficients

d = Perpendicular and horizontal distance from track centerline (feet)

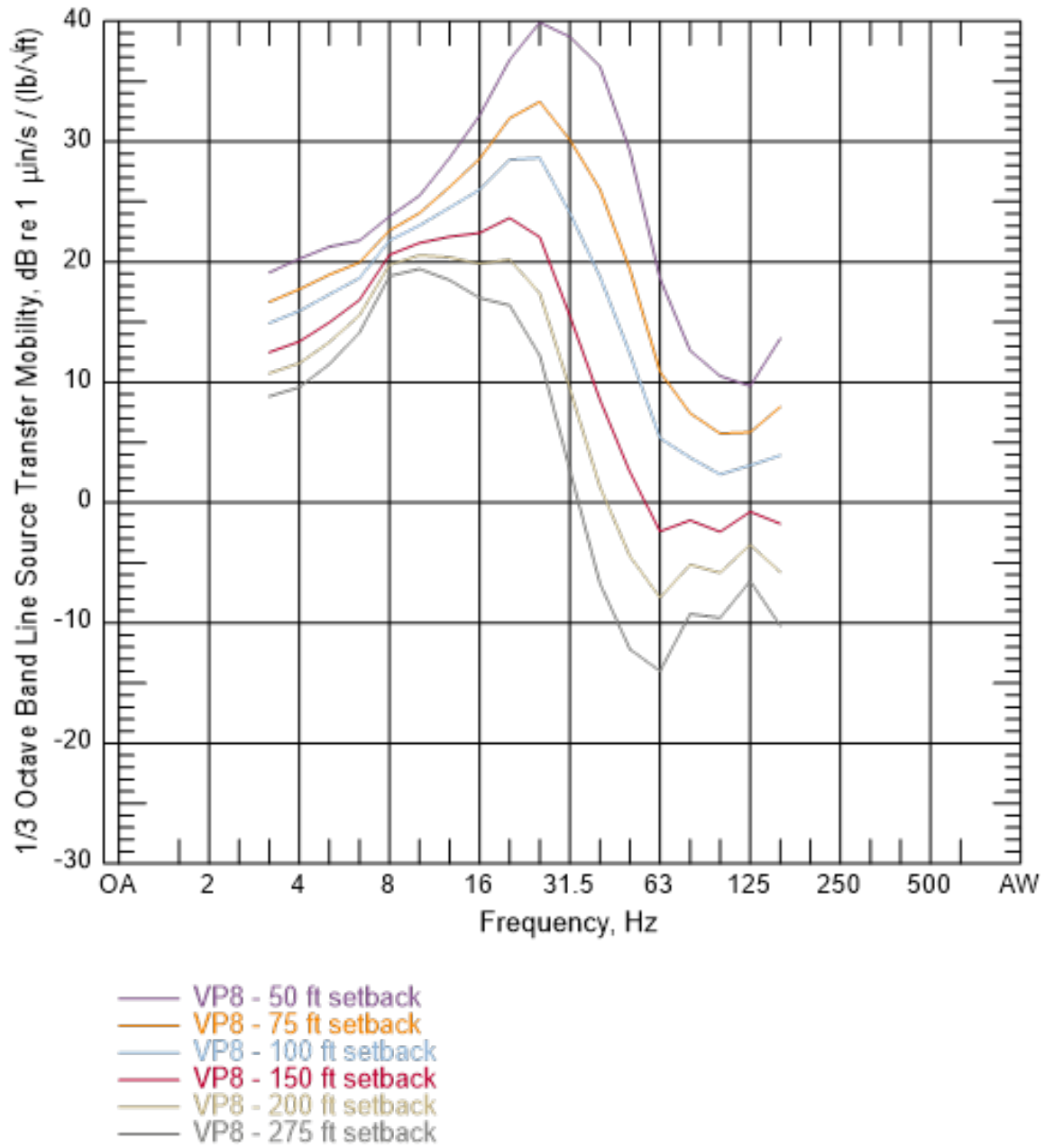


Figure C-15 Line Source Response for Surface Impact Site VP8

Table C-16 Line Source Response Coefficients for Surface Impact Site VP9

| Frequency (Hz) | A | B | C |
|----------------|-------|-------|---|
| 3.15 | 14.1 | -4.7 | 0 |
| 4 | 23.6 | -7.6 | 0 |
| 5 | 29.4 | -9.3 | 0 |
| 6.3 | 31.3 | -8.8 | 0 |
| 8 | 29.3 | -5.9 | 0 |
| 10 | 32.1 | -4.9 | 0 |
| 12.5 | 42.7 | -8.1 | 0 |
| 16 | 59.7 | -16.0 | 0 |
| 20 | 71.7 | -21.8 | 0 |
| 25 | 78.6 | -26.0 | 0 |
| 31.5 | 88.6 | -32.2 | 0 |
| 40 | 94.9 | -37.8 | 0 |
| 50 | 100.3 | -43.1 | 0 |
| 63 | 112.0 | -53.0 | 0 |
| 80 | 107.5 | -54.9 | 0 |
| 100 | 58.0 | -33.8 | 0 |
| 125 | 24.6 | -18.4 | 0 |

Hz = hertz

$$LSR(d) = A + B * \text{Log}(d) + C * \text{Log}^2(d)$$

Where: A, B, C = Polynomial coefficients

d = Perpendicular and horizontal distance from track centerline (feet)

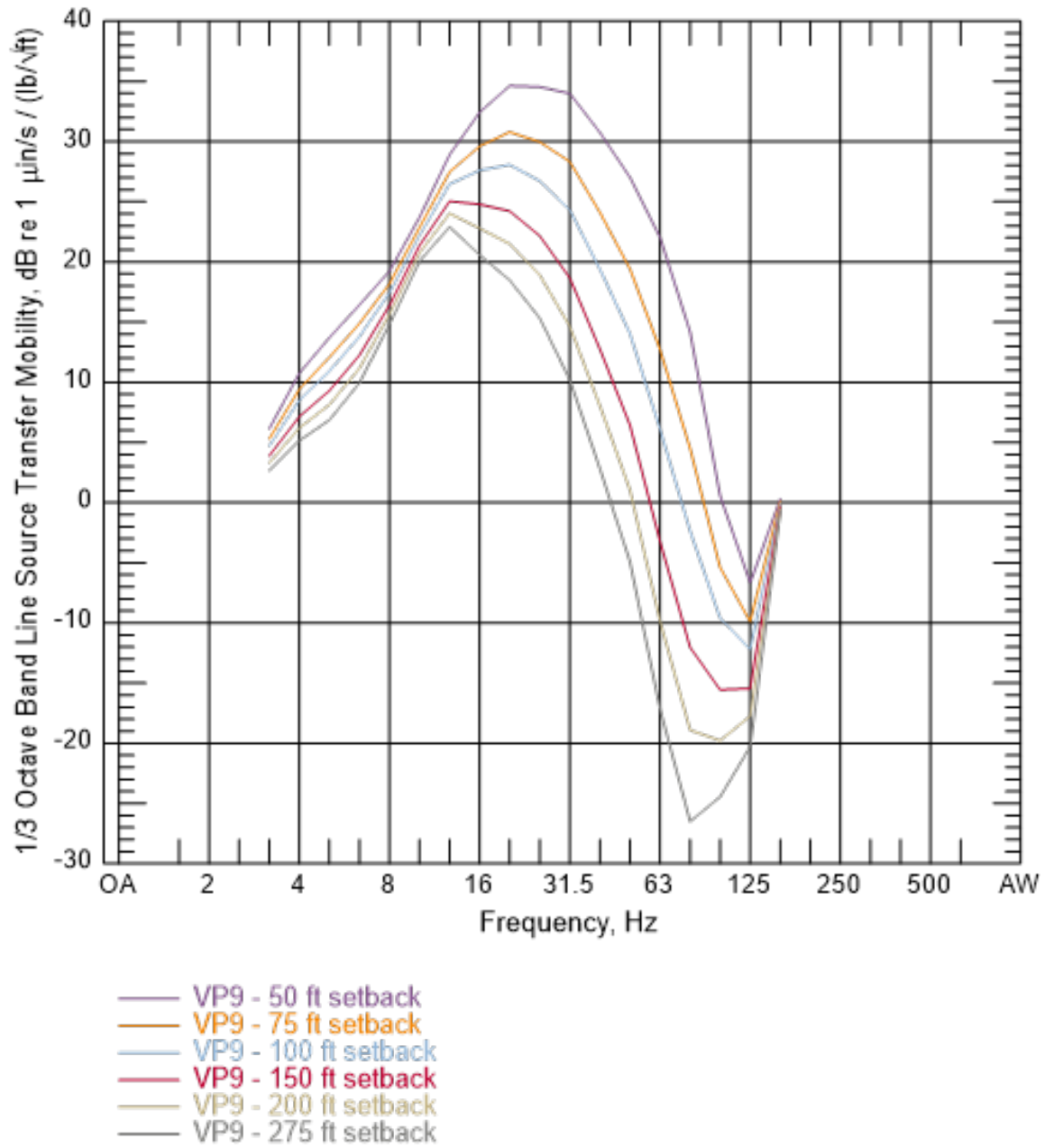


Figure C-16 Line Source Response for Surface Impact Site VP9

Table C-17 Line Source Response Coefficients for Borehole Impact Site VP10—50 ft Depth

| Frequency (Hz) | A | B | C |
|----------------|-------|-------|------|
| 3.15 | 11.4 | 0.3 | -0.1 |
| 4 | 15.7 | 1.5 | -0.5 |
| 5 | 14.1 | 5.5 | -2.4 |
| 6.3 | 19.9 | 5.3 | -3.3 |
| 8 | 22.5 | 5.0 | -3.4 |
| 10 | 27.9 | 3.7 | -3.6 |
| 12.5 | 29.3 | 2.8 | -3.6 |
| 16 | 27.2 | 3.7 | -3.6 |
| 20 | 27.2 | 2.6 | -3.6 |
| 25 | 37.3 | -4.9 | -3.5 |
| 31.5 | 53.0 | -13.8 | -3.1 |
| 40 | 45.3 | -9.2 | -3.4 |
| 50 | 62.6 | -20.3 | -2.8 |
| 63 | 55.2 | -18.6 | -2.9 |
| 80 | 66.9 | -25.9 | -2.5 |
| 100 | 79.3 | -34.6 | -2.1 |
| 125 | 105.3 | -52.8 | -1.4 |

Hz = hertz

$$LSR(d) = A + B * \text{Log}(d) + C * \text{Log}^2(d)$$

Where: A, B, C = Polynomial coefficients

d = Perpendicular and horizontal distance from track centerline (feet)

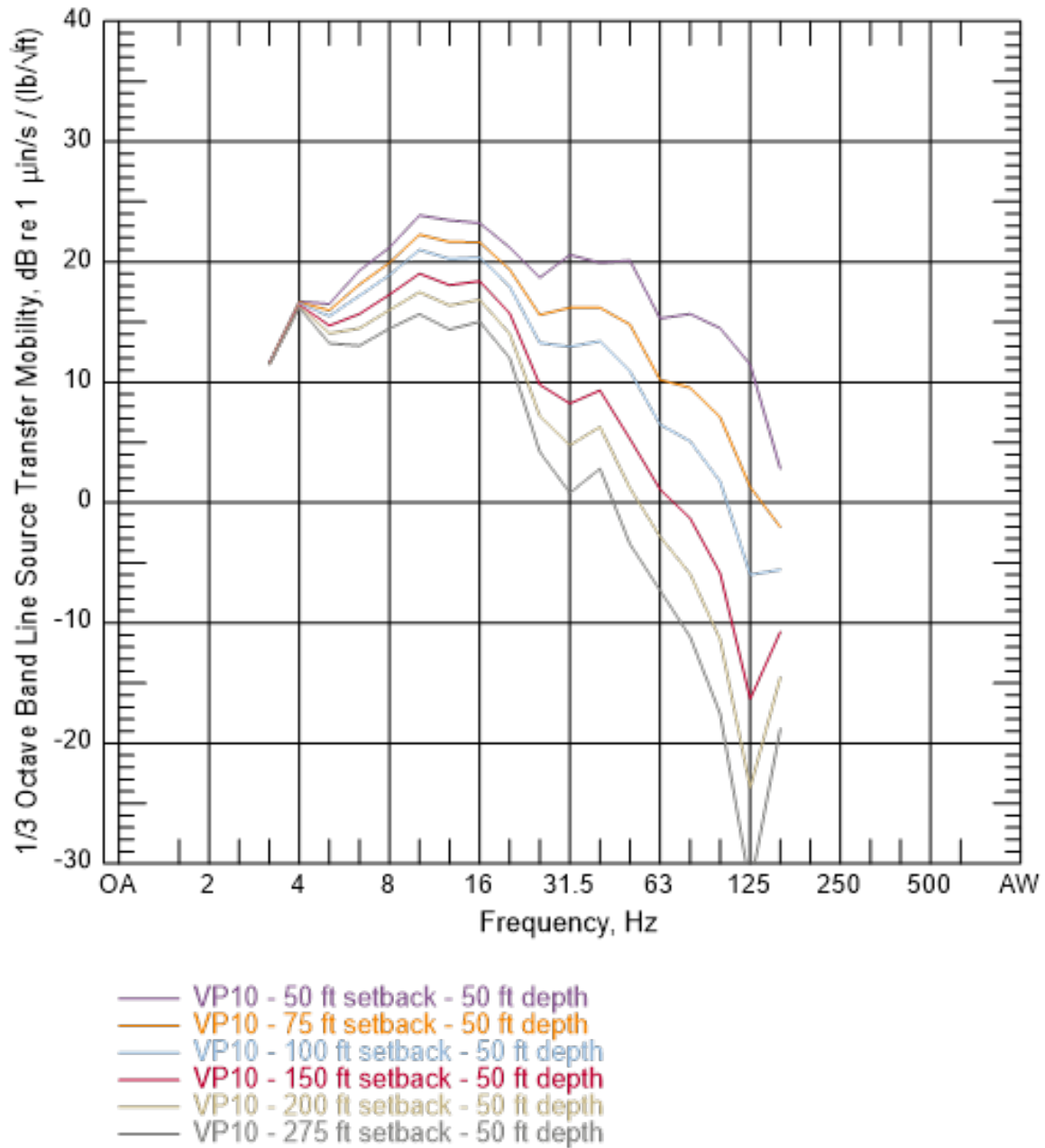


Figure C-17 Line Source Response for Borehole Impact Site VP10—50 ft Depth

Table C-18 Line Source Response Coefficients for Borehole Impact Site VP10—60 ft Depth

| Frequency (Hz) | A | B | C |
|----------------|-------|-------|-------|
| 3.15 | 2.6 | 5.5 | -2.3 |
| 4 | -65.1 | 80.9 | -21.2 |
| 5 | 13.9 | 6.1 | -2.9 |
| 6.3 | 14.1 | 5.9 | -2.6 |
| 8 | 19.1 | 5.9 | -3.4 |
| 10 | 27.0 | 3.5 | -3.8 |
| 12.5 | -10.1 | 37.3 | -11.3 |
| 16 | 41.6 | -3.4 | -3.8 |
| 20 | 35.2 | -1.8 | -3.9 |
| 25 | 48.4 | -11.2 | -3.5 |
| 31.5 | 63.5 | -20.2 | -3.0 |
| 40 | 67.2 | -22.0 | -2.9 |
| 50 | 48.6 | -11.9 | -3.5 |
| 63 | 47.0 | -13.5 | -3.4 |
| 80 | 67.2 | -27.1 | -2.7 |
| 100 | 80.4 | -35.5 | -2.3 |
| 125 | 79.2 | -38.0 | -2.2 |

Hz = hertz

$$LSR(d) = A + B * \text{Log}(d) + C * \text{Log}^2(d)$$

Where: A, B, C = Polynomial coefficients

d = Perpendicular and horizontal distance from track centerline (feet)

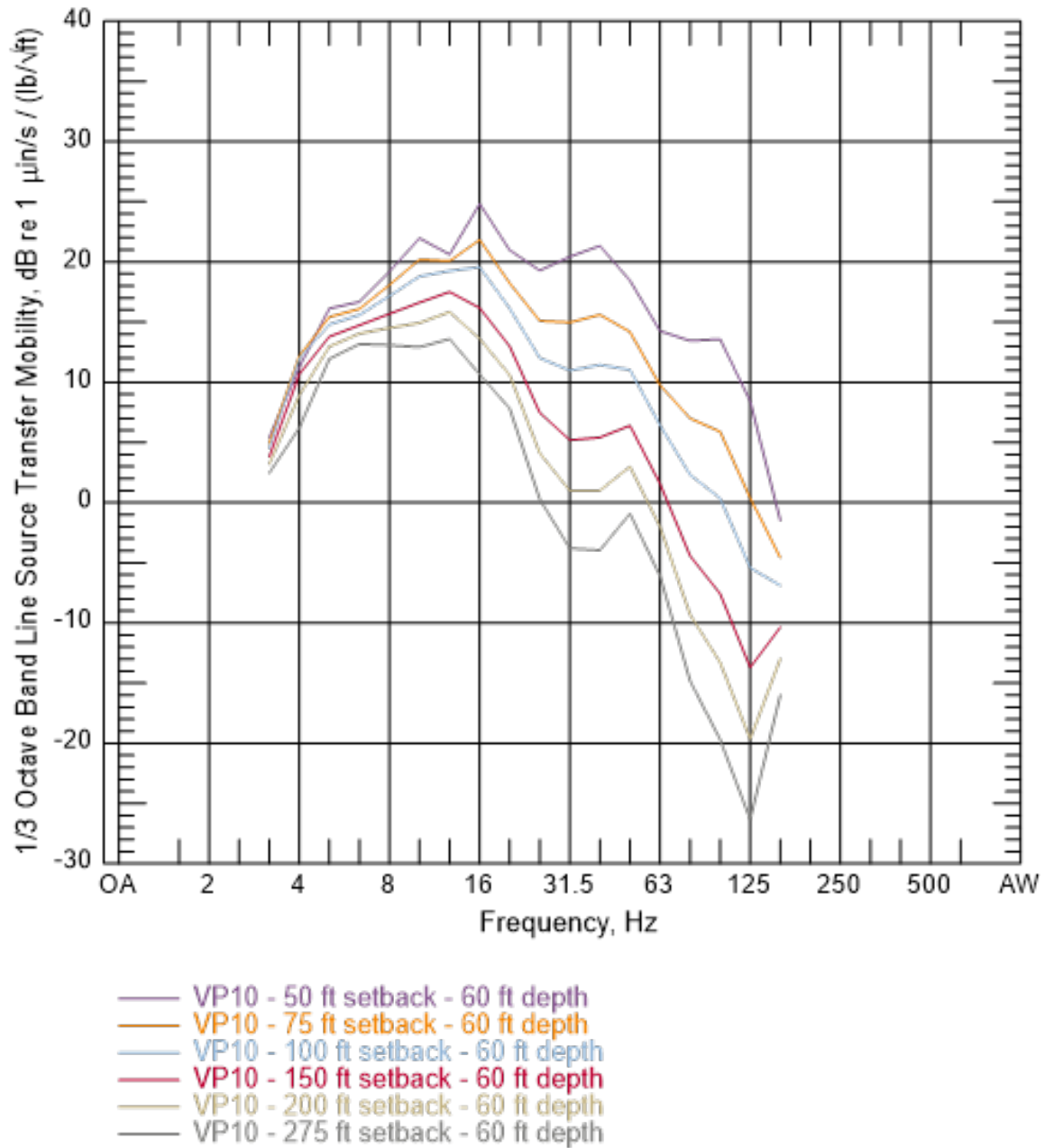


Figure C-18 Line Source Response for Borehole Impact Site VP10—60 ft Depth

Table C-19 Line Source Response Coefficients for Borehole Impact Site VP10—70 ft Depth

| Frequency (Hz) | A | B | C |
|----------------|--------|-------|-------|
| 3.15 | 18.2 | 1.4 | -4.1 |
| 4 | -115.9 | 132.1 | -35.2 |
| 5 | 12.5 | 6.5 | -3.0 |
| 6.3 | 25.8 | 2.9 | -4.0 |
| 8 | 23.8 | 4.2 | -4.0 |
| 10 | 26.4 | 4.5 | -3.9 |
| 12.5 | 45.3 | -1.2 | -4.1 |
| 16 | 34.0 | 1.3 | -4.1 |
| 20 | 42.6 | -5.4 | -4.0 |
| 25 | 49.4 | -11.3 | -3.7 |
| 31.5 | 51.0 | -13.1 | -3.6 |
| 40 | 76.1 | -26.7 | -2.9 |
| 50 | 81.8 | -30.8 | -2.7 |
| 63 | -134.3 | 159.5 | -44.2 |
| 80 | 78.5 | -31.2 | -2.7 |
| 100 | 76.0 | -30.9 | -2.7 |
| 125 | 106.3 | -48.5 | -1.9 |

Hz = hertz

$$LSR(d) = A + B * \text{Log}(d) + C * \text{Log}^2(d)$$

Where: A, B, C = Polynomial coefficients

d = Perpendicular and horizontal distance from track centerline (feet)

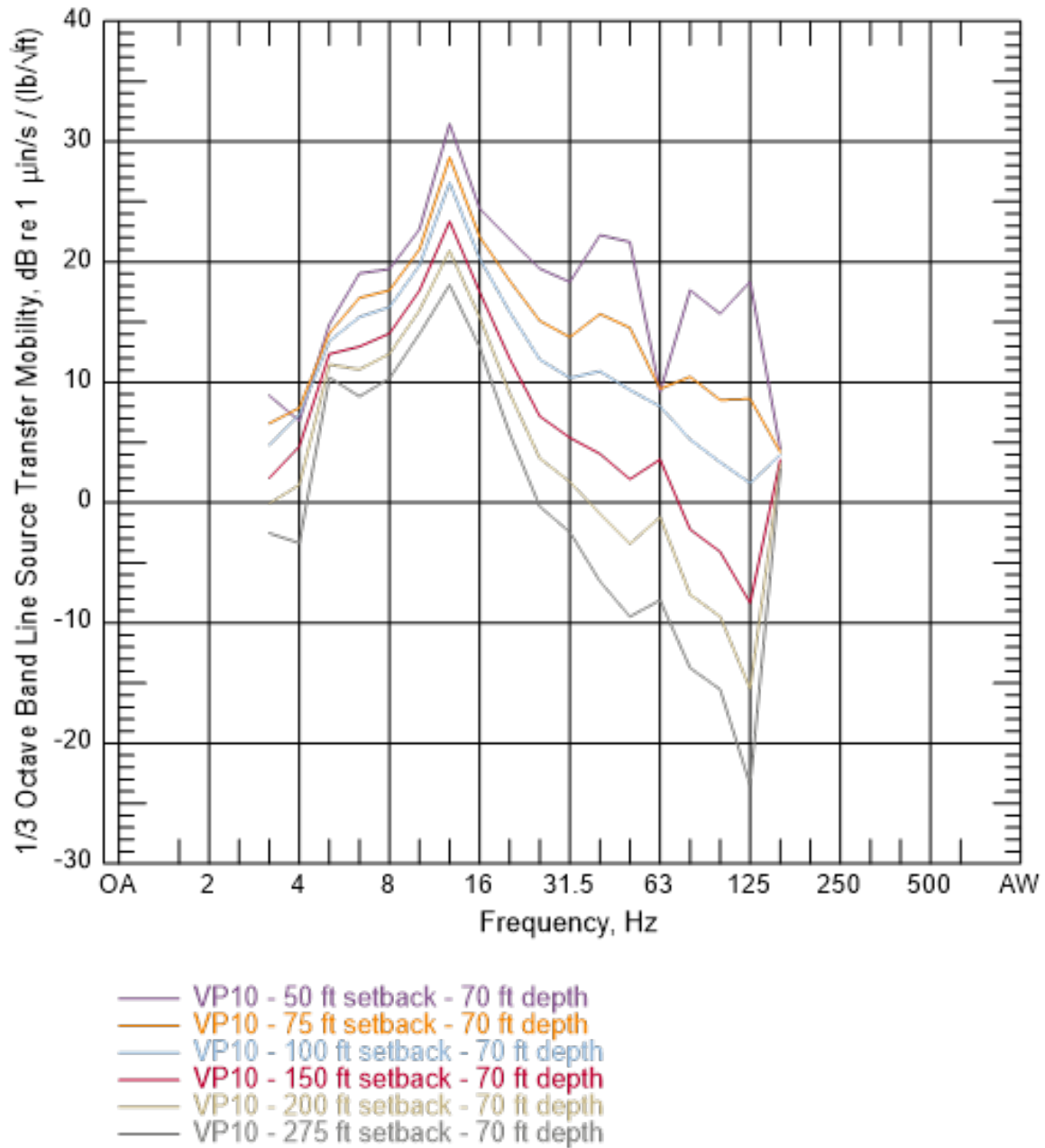


Figure C-19 Line Source Response for Borehole Impact Site VP10—70 ft Depth

Table C-20 Line Source Response Coefficients for Surface Impact Site VP11

| Frequency (Hz) | A | B | C |
|----------------|-------|-------|---|
| 3.15 | 18.6 | -5.7 | 0 |
| 4 | 25.6 | -7.1 | 0 |
| 5 | 32.0 | -8.5 | 0 |
| 6.3 | 30.7 | -6.9 | 0 |
| 8 | 32.5 | -7.2 | 0 |
| 10 | 37.8 | -9.2 | 0 |
| 12.5 | 45.0 | -11.7 | 0 |
| 16 | 56.3 | -16.2 | 0 |
| 20 | 69.5 | -21.9 | 0 |
| 25 | 90.4 | -31.4 | 0 |
| 31.5 | 104.6 | -38.7 | 0 |
| 40 | 110.9 | -44.1 | 0 |
| 50 | 96.2 | -40.4 | 0 |
| 63 | 84.9 | -39.4 | 0 |
| 80 | 84.1 | -42.2 | 0 |
| 100 | 53.3 | -29.7 | 0 |
| 125 | 36.9 | -22.9 | 0 |

Hz = hertz

$$LSR(d) = A + B * \text{Log}(d) + C * \text{Log}^2(d)$$

Where: A, B, C = Polynomial coefficients

d = Perpendicular and horizontal distance from track centerline (feet)

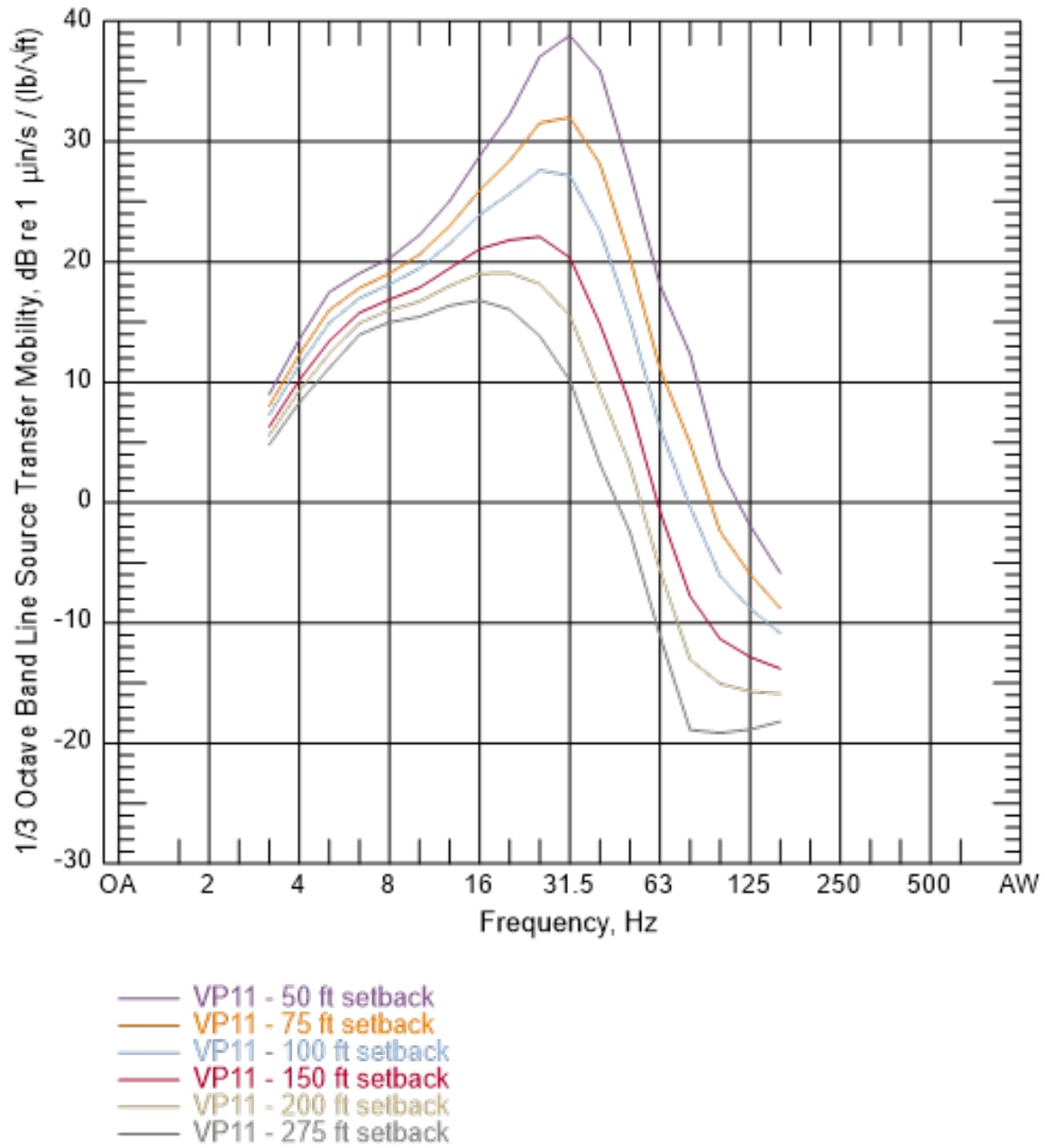


Figure C-20 Line Source Response for Surface Impact Site VP11

Table C-21 Line Source Response Coefficients for Borehole Impact Site VP12—50 ft Depth

| Frequency (Hz) | A | B | C |
|----------------|-------|-------|-------|
| 3.15 | 8.9 | 3.6 | -1.4 |
| 4 | 9.7 | 5.8 | -2.9 |
| 5 | 15.4 | 5.8 | -2.8 |
| 6.3 | 13.8 | 5.4 | -2.3 |
| 8 | 16.3 | 5.8 | -2.8 |
| 10 | -15.6 | 43.1 | -13.8 |
| 12.5 | 16.4 | 5.7 | -2.6 |
| 16 | -66.2 | 95.8 | -26.6 |
| 20 | 4.3 | 24.3 | -8.5 |
| 25 | 7.1 | 27.2 | -10.8 |
| 31.5 | 58.4 | -15.4 | -3.0 |
| 40 | -22.0 | 66.9 | -25.0 |
| 50 | 59.4 | -21.1 | -2.8 |
| 63 | 48.4 | -16.5 | -3.0 |
| 80 | 62.6 | -26.5 | -2.5 |
| 100 | 66.8 | -31.1 | -2.3 |
| 125 | 77.8 | -39.6 | -1.9 |

Hz = hertz

$$LSR(d) = A + B * \text{Log}(d) + C * \text{Log}^2(d)$$

Where: A, B, C = Polynomial coefficients

d = Perpendicular and horizontal distance from track centerline (feet)

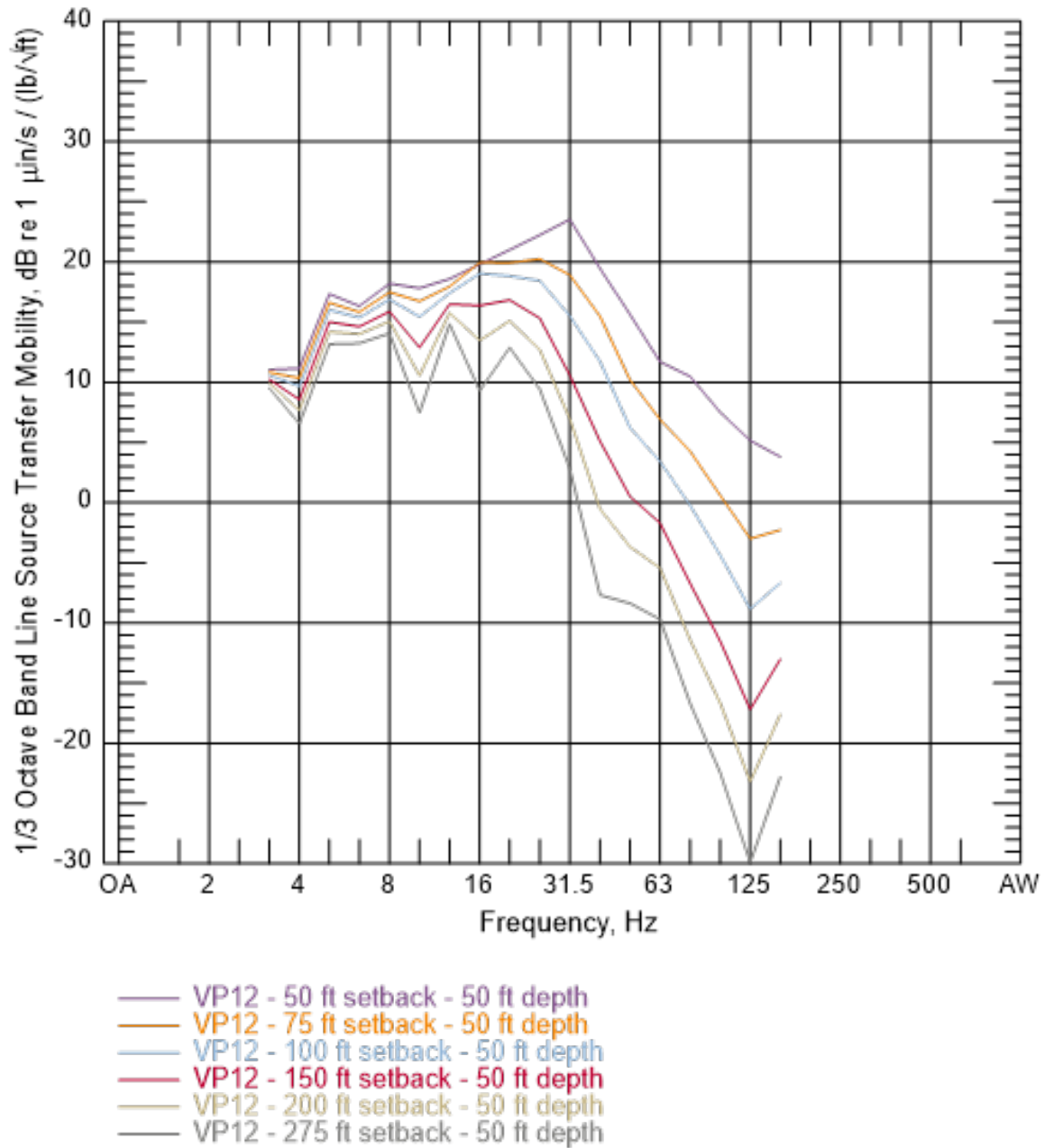


Figure C-21 Line Source Response for Borehole Impact Site VP12—50 ft Depth

Table C-22 Line Source Response Coefficients for Borehole Impact Site VP12—60 ft Depth

| Frequency (Hz) | A | B | C |
|----------------|-------|-------|-------|
| 3.15 | -37.0 | 51.7 | -14.7 |
| 4 | 15.4 | 4.3 | -3.7 |
| 5 | 23.7 | 2.1 | -3.9 |
| 6.3 | -3.9 | 23.3 | -7.1 |
| 8 | 4.7 | 19.2 | -7.3 |
| 10 | 21.9 | 4.3 | -3.7 |
| 12.5 | 22.9 | 4.3 | -3.7 |
| 16 | 22.9 | 4.3 | -3.7 |
| 20 | 21.8 | 5.1 | -3.6 |
| 25 | 29.9 | 1.9 | -3.9 |
| 31.5 | 49.8 | -9.0 | -3.6 |
| 40 | 54.7 | -13.2 | -3.4 |
| 50 | 58.3 | -17.4 | -3.2 |
| 63 | 28.0 | -3.5 | -3.8 |
| 80 | 53.6 | -19.9 | -3.1 |
| 100 | 80.5 | -37.2 | -2.2 |
| 125 | 89.3 | -41.9 | -2.0 |

Hz = hertz

$$LSR(d) = A + B * \text{Log}(d) + C * \text{Log}^2(d)$$

Where: A, B, C = Polynomial coefficients

d = Perpendicular and horizontal distance from track centerline (feet)

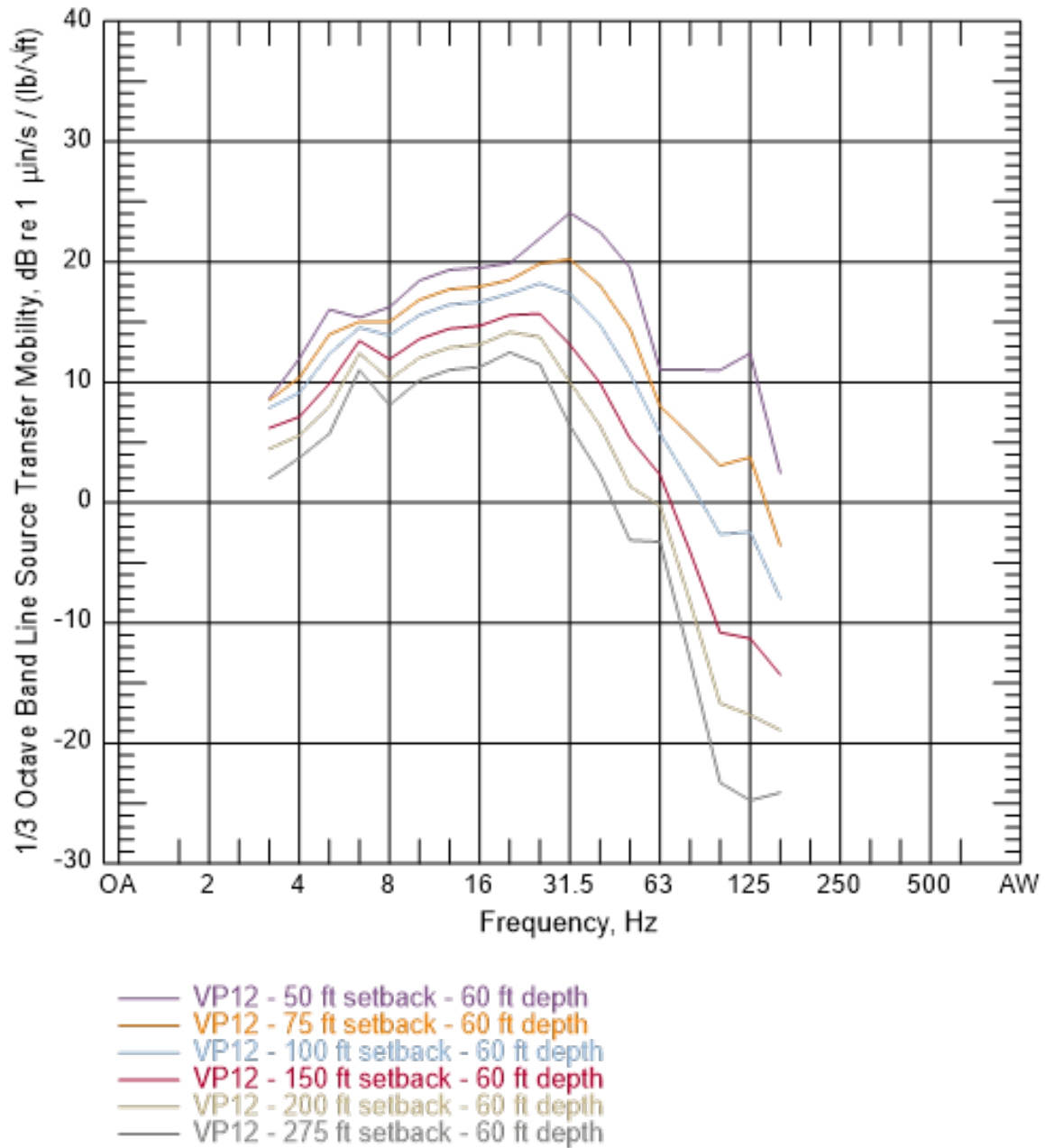


Figure C-22 Line Source Response for Borehole Impact Site VP12—60 ft Depth

Table C-23 Line Source Response Coefficients for Borehole Impact Site VP12—70 ft Depth

| Frequency (Hz) | A | B | C |
|----------------|-------|-------|-------|
| 3.15 | 4.2 | 4.8 | -1.8 |
| 4 | 8.5 | 6.4 | -2.9 |
| 5 | 14.6 | 6.4 | -3.4 |
| 6.3 | 12.8 | 6.5 | -3.1 |
| 8 | 11.7 | 6.2 | -2.7 |
| 10 | 14.5 | 6.4 | -3.4 |
| 12.5 | 17.1 | 6.4 | -3.4 |
| 16 | 16.0 | 6.5 | -3.3 |
| 20 | 18.2 | 6.5 | -3.0 |
| 25 | 18.2 | 6.3 | -2.8 |
| 31.5 | 26.0 | 3.6 | -4.0 |
| 40 | 37.4 | -4.0 | -4.0 |
| 50 | 60.7 | -18.6 | -3.3 |
| 63 | -0.1 | 46.0 | -21.2 |
| 80 | 77.8 | -31.8 | -2.7 |
| 100 | 114.2 | -53.2 | -1.8 |
| 125 | 108.7 | -51.3 | -1.8 |

Hz = hertz

$$LSR(d) = A + B * \text{Log}(d) + C * \text{Log}^2(d)$$

Where: A, B, C = Polynomial coefficients

d = Perpendicular and horizontal distance from track centerline (feet)

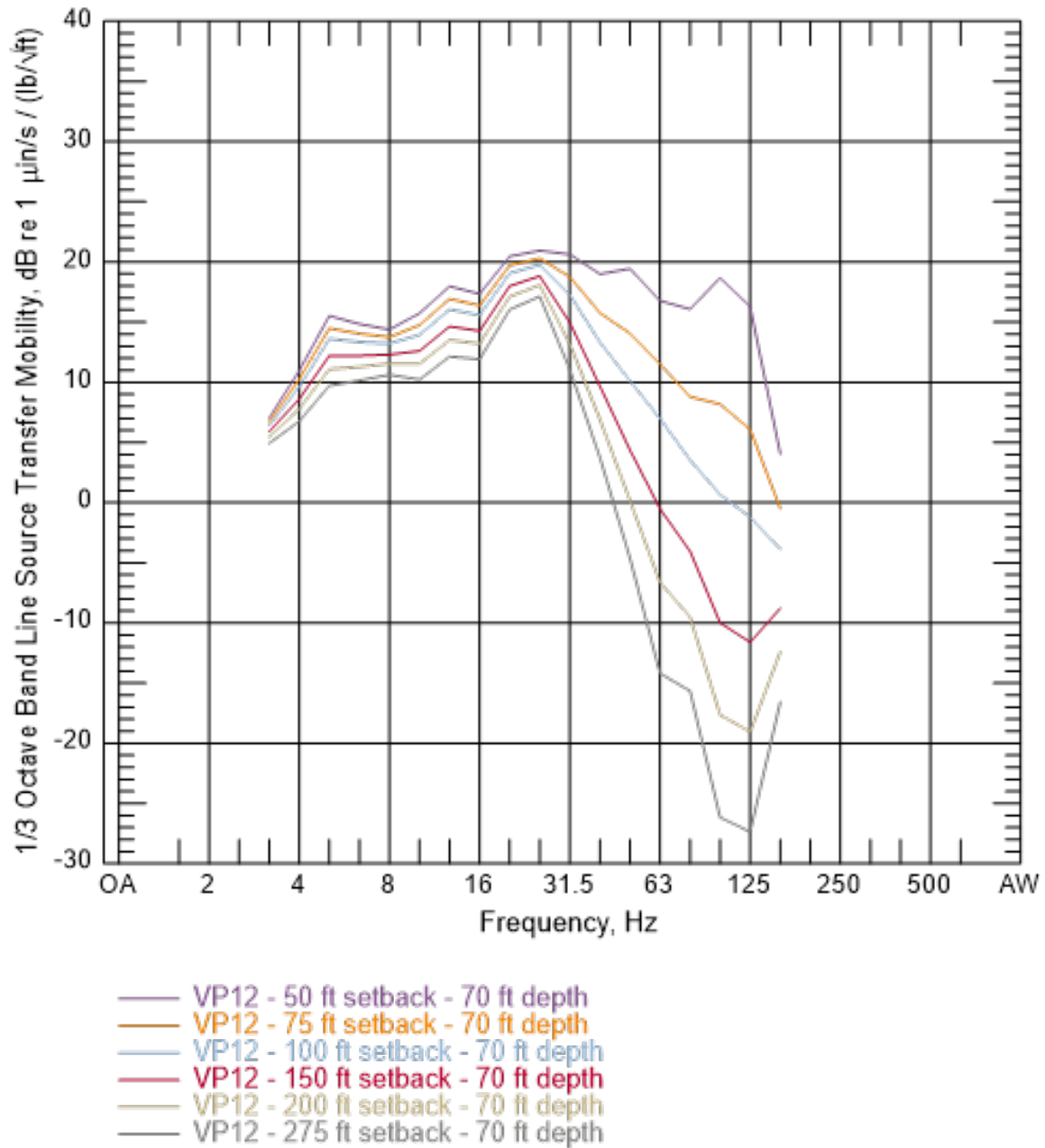


Figure C-23 Line Source Response for Borehole Impact Site VP12—70 ft Depth

Table C-24 Line Source Response Coefficients for Borehole Impact Site VP12—80 ft Depth

| Frequency (Hz) | A | B | C |
|----------------|--------|-------|-------|
| 3.15 | 5.2 | 6.8 | -3.3 |
| 4 | 7.1 | 5.0 | -2.0 |
| 5 | -11.3 | 31.9 | -10.1 |
| 6.3 | 12.6 | 6.7 | -3.3 |
| 8 | 10.6 | 5.7 | -2.3 |
| 10 | 14.4 | 6.6 | -3.6 |
| 12.5 | 13.7 | 6.5 | -2.9 |
| 16 | 15.5 | 6.7 | -3.4 |
| 20 | 21.0 | 6.0 | -3.9 |
| 25 | 27.9 | 4.5 | -4.1 |
| 31.5 | 30.1 | 2.8 | -4.2 |
| 40 | 28.4 | 2.8 | -4.2 |
| 50 | -210.6 | 231.8 | -60.2 |
| 63 | 75.2 | -27.7 | -3.1 |
| 80 | 101.1 | -43.4 | -2.4 |
| 100 | 109.8 | -49.9 | -2.1 |
| 125 | 64.9 | -28.4 | -3.1 |

Hz = hertz

$$LSR(d) = A + B * \text{Log}(d) + C * \text{Log}^2(d)$$

Where: A, B, C = Polynomial coefficients

d = Perpendicular and horizontal distance from track centerline (feet)

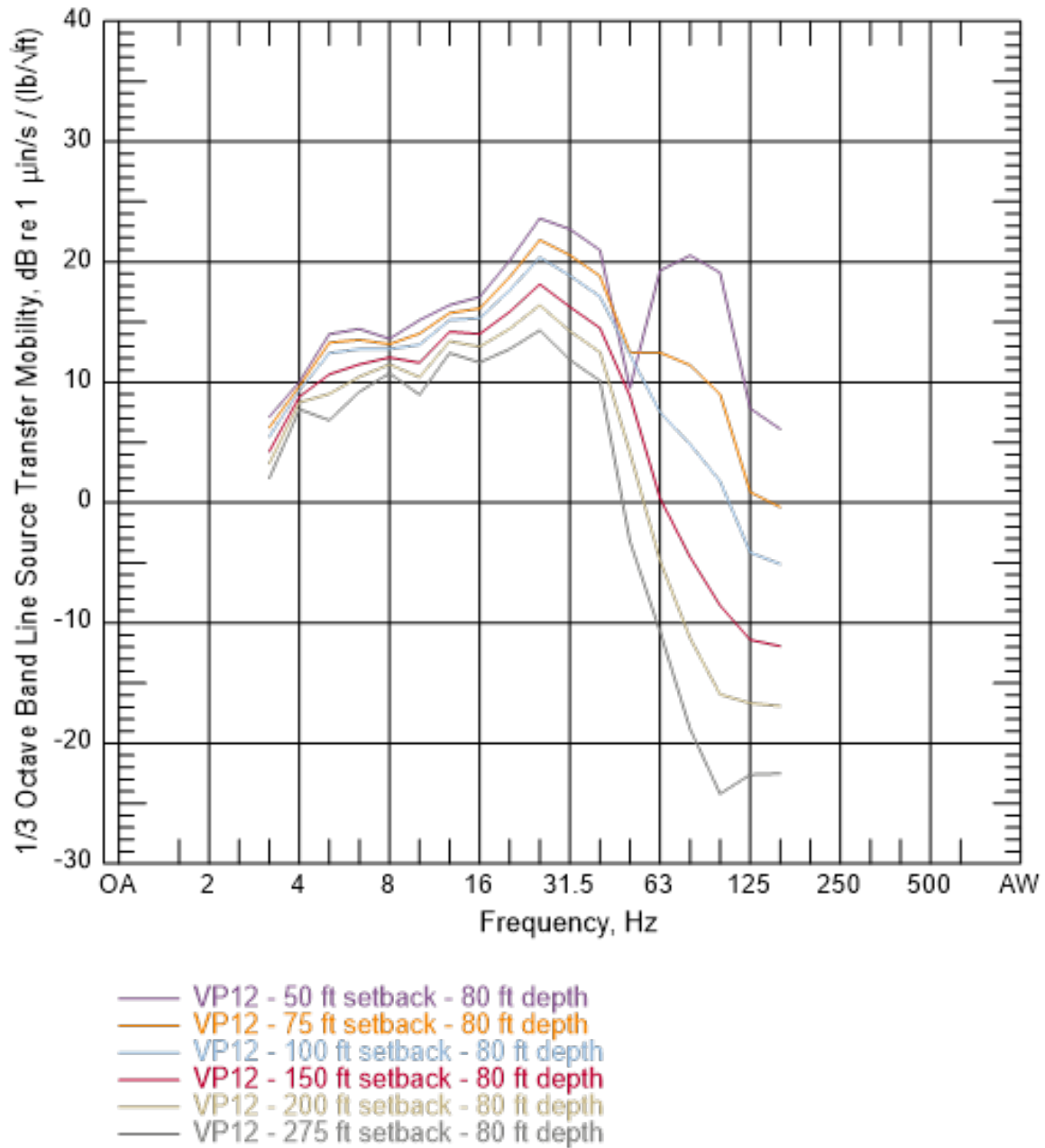


Figure C-24 Line Source Response for Borehole Impact Site VP12—80 ft Depth

Table C-25 Line Source Response Coefficients for Borehole Impact Site VP12—90 ft Depth

| Frequency (Hz) | A | B | C |
|----------------|-------|-------|------|
| 3.15 | 7.2 | 6.9 | -3.6 |
| 4 | 6.5 | 5.0 | -1.9 |
| 5 | 11.5 | 6.9 | -3.6 |
| 6.3 | 10.1 | 6.8 | -3.1 |
| 8 | 10.1 | 6.8 | -3.1 |
| 10 | 12.0 | 6.7 | -3.0 |
| 12.5 | 12.4 | 5.0 | -1.9 |
| 16 | 15.6 | 6.6 | -3.8 |
| 20 | 13.5 | 5.6 | -2.2 |
| 25 | 18.5 | 6.9 | -3.7 |
| 31.5 | 43.5 | -4.3 | -4.4 |
| 40 | 42.8 | -4.3 | -4.4 |
| 50 | 48.5 | -8.8 | -4.2 |
| 63 | 26.6 | 0.0 | -4.5 |
| 80 | 62.4 | -21.2 | -3.7 |
| 100 | 109.5 | -49.4 | -2.3 |
| 125 | 94.0 | -42.8 | -2.6 |

Hz = hertz

$$LSR(d) = A + B * \text{Log}(d) + C * \text{Log}^2(d)$$

Where: A, B, C = Polynomial coefficients

d = Perpendicular and horizontal distance from track centerline (feet)

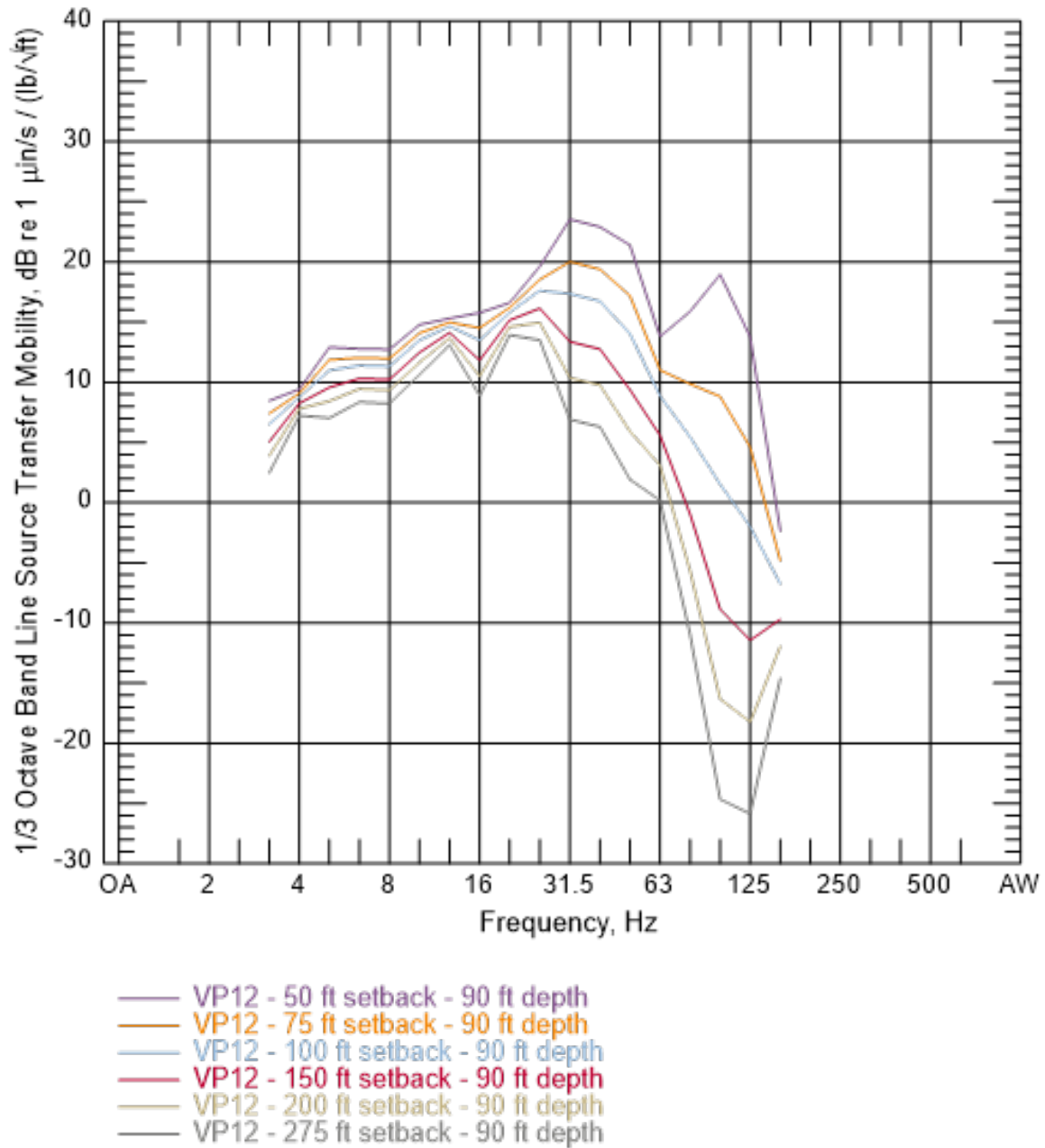


Figure C-25 Line Source Response for Borehole Impact Site VP12—90 ft Depth

Table C-26 Line Source Response Coefficients for Surface Impact Site VP13

| Frequency (Hz) | A | B | C |
|----------------|------|-------|---|
| 3.15 | 17.8 | -2.8 | 0 |
| 4 | 20.4 | -3.3 | 0 |
| 5 | 22.5 | -3.1 | 0 |
| 6.3 | 22.6 | -2.7 | 0 |
| 8 | 26.5 | -4.6 | 0 |
| 10 | 26.6 | -3.6 | 0 |
| 12.5 | 29.0 | -4.9 | 0 |
| 16 | 35.2 | -8.6 | 0 |
| 20 | 44.1 | -13.4 | 0 |
| 25 | 57.0 | -19.5 | 0 |
| 31.5 | 70.4 | -26.6 | 0 |
| 40 | 70.3 | -28.1 | 0 |
| 50 | 65.0 | -26.4 | 0 |
| 63 | 63.1 | -27.3 | 0 |
| 80 | 65.0 | -30.1 | 0 |
| 100 | 67.3 | -32.7 | 0 |
| 125 | 61.8 | -30.1 | 0 |

Hz = hertz

$$LSR(d) = A + B * \text{Log}(d) + C * \text{Log}^2(d)$$

Where: A, B, C = Polynomial coefficients

d = Perpendicular and horizontal distance from track centerline (feet)

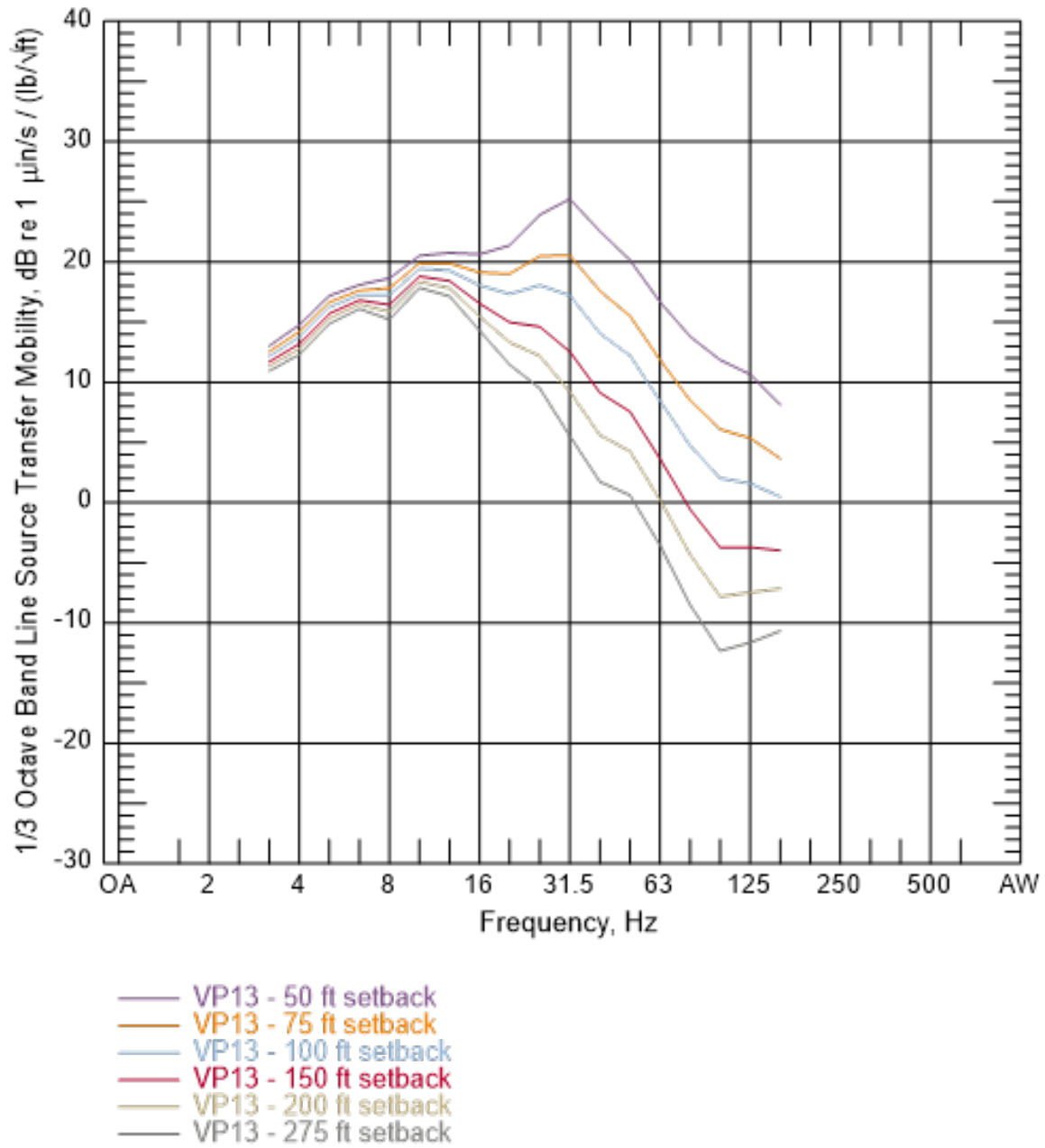


Figure C-26 Line Source Response for Surface Impact Site VP13

Table C-27 Line Source Response Coefficients for Surface Impact Site VP14

| Frequency (Hz) | A | B | C |
|----------------|-------|-------|---|
| 3.15 | 10.8 | -1.0 | 0 |
| 4 | 19.4 | -4.6 | 0 |
| 5 | 25.2 | -6.9 | 0 |
| 6.3 | 24.6 | -5.4 | 0 |
| 8 | 27.8 | -4.0 | 0 |
| 10 | 38.4 | -6.4 | 0 |
| 12.5 | 56.5 | -14.6 | 0 |
| 16 | 75.2 | -24.0 | 0 |
| 20 | 79.6 | -26.7 | 0 |
| 25 | 90.3 | -33.5 | 0 |
| 31.5 | 105.9 | -43.6 | 0 |
| 40 | 109.4 | -49.6 | 0 |
| 50 | 104.0 | -50.0 | 0 |
| 63 | 101.2 | -50.6 | 0 |
| 80 | 82.6 | -43.9 | 0 |
| 100 | 47.3 | -28.6 | 0 |
| 125 | 26.1 | -19.3 | 0 |

Hz = hertz

$$LSR(d) = A + B * \text{Log}(d) + C * \text{Log}^2(d)$$

Where: A, B, C = Polynomial coefficients

d = Perpendicular and horizontal distance from track centerline (feet)

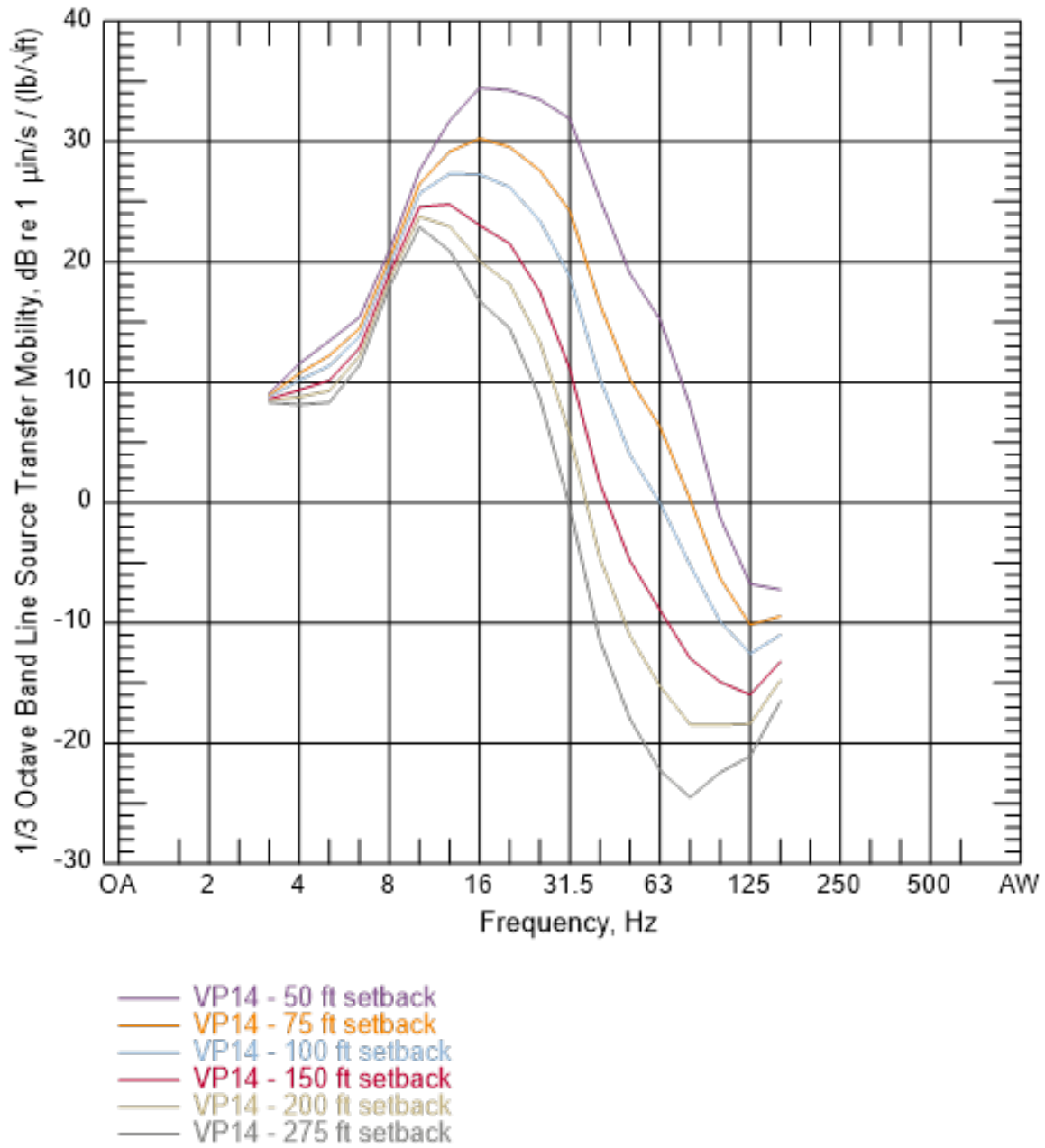


Figure C-27 Line Source Response for Surface Impact Site VP14

Table C-28 Line Source Response Coefficients for Borehole Impact Site VP15—80 ft Depth

| Frequency (Hz) | A | B | C |
|----------------|-------|--------|-------|
| 3.15 | 11.6 | 3.1 | -4.2 |
| 4 | 18.8 | 1.8 | -4.3 |
| 5 | 21.2 | 2.5 | -4.2 |
| 6.3 | 40.9 | -7.7 | -4.1 |
| 8 | 42.0 | -7.2 | -4.1 |
| 10 | 36.9 | 1.7 | -7.1 |
| 12.5 | 69.0 | -19.0 | -3.5 |
| 16 | 102.3 | -37.6 | -2.6 |
| 20 | 107.9 | -42.4 | -2.4 |
| 25 | 195.5 | -114.7 | 11.9 |
| 31.5 | 97.3 | -37.5 | -2.6 |
| 40 | 75.2 | -27.9 | -3.1 |
| 50 | 64.5 | -18.8 | -5.2 |
| 63 | 65.1 | -25.0 | -3.2 |
| 80 | 7.7 | 34.4 | -19.1 |
| 100 | 115.9 | -54.5 | -1.9 |
| 125 | 129.4 | -65.7 | -1.5 |

Hz = hertz

$$LSR(d) = A + B * \text{Log}(d) + C * \text{Log}^2(d)$$

Where: A, B, C = Polynomial coefficients

d = Perpendicular and horizontal distance from track centerline (feet)

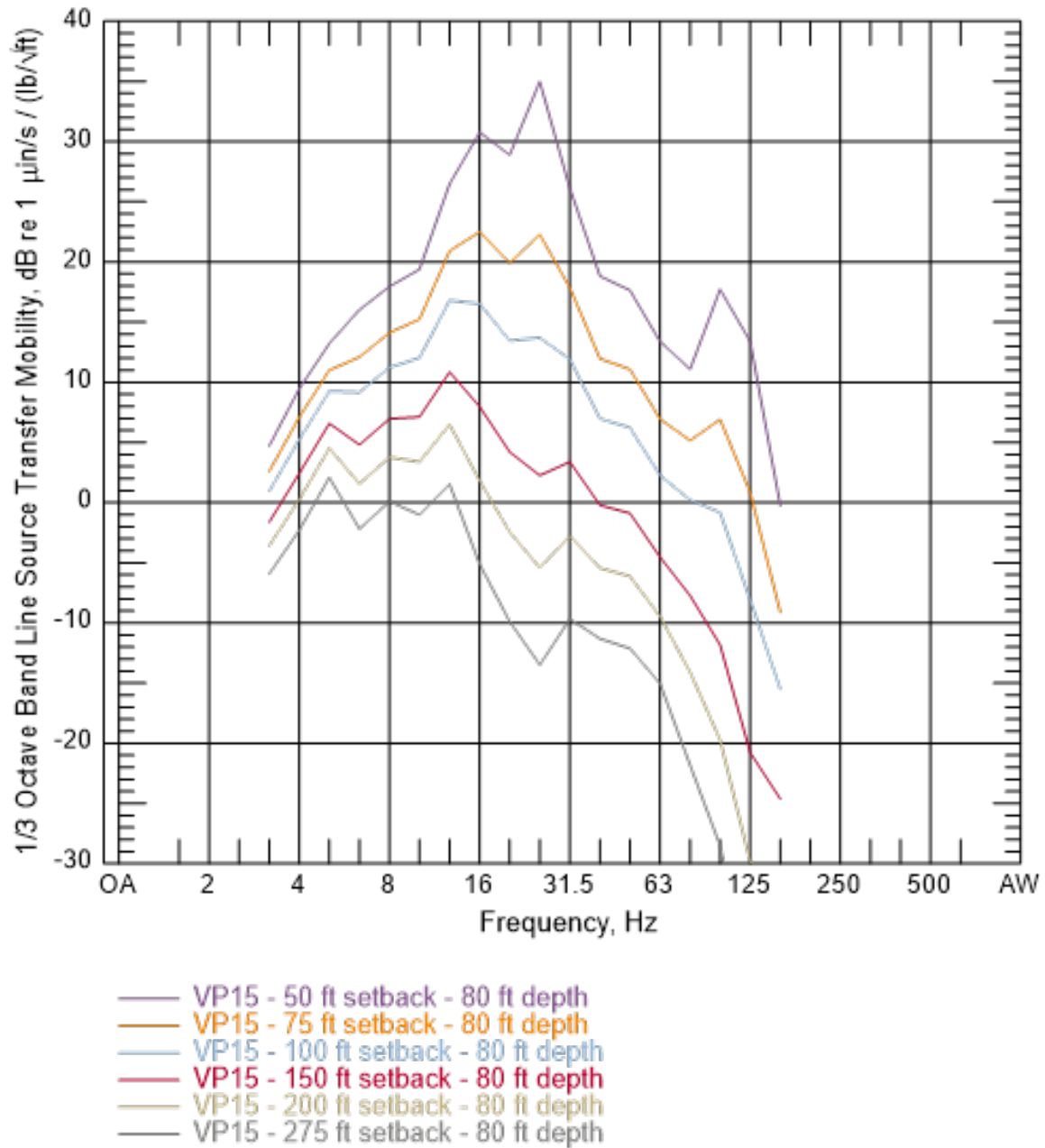


Figure C-28 Line Source Response for Borehole Impact Site VP15—80 ft Depth

Table C-29 Line Source Response Coefficients for Borehole Impact Site VP15—90 ft Depth

| Frequency (Hz) | A | B | C |
|----------------|-------|-------|-------|
| 3.15 | 0.1 | 6.5 | -2.8 |
| 4 | 24.5 | -0.4 | -4.5 |
| 5 | 22.9 | 0.9 | -4.4 |
| 6.3 | -21.4 | 39.6 | -12.0 |
| 8 | 52.8 | -11.8 | -4.1 |
| 10 | 64.4 | -17.0 | -3.9 |
| 12.5 | 82.0 | -23.7 | -3.5 |
| 16 | 126.9 | -46.0 | -2.4 |
| 20 | 135.1 | -55.5 | -2.1 |
| 25 | 136.4 | -56.6 | -2.0 |
| 31.5 | 176.5 | -76.0 | -1.4 |
| 40 | 132.2 | -56.4 | -2.0 |
| 50 | 131.2 | -54.4 | -2.1 |
| 63 | 135.0 | -57.0 | -2.0 |
| 80 | 183.9 | -84.5 | -1.2 |
| 100 | 181.5 | -83.6 | -1.2 |
| 125 | 146.6 | -70.4 | -1.5 |

Hz = hertz

$$LSR(d) = A + B * \text{Log}(d) + C * \text{Log}^2(d)$$

Where: A, B, C = Polynomial coefficients

d = Perpendicular and horizontal distance from track centerline (feet)

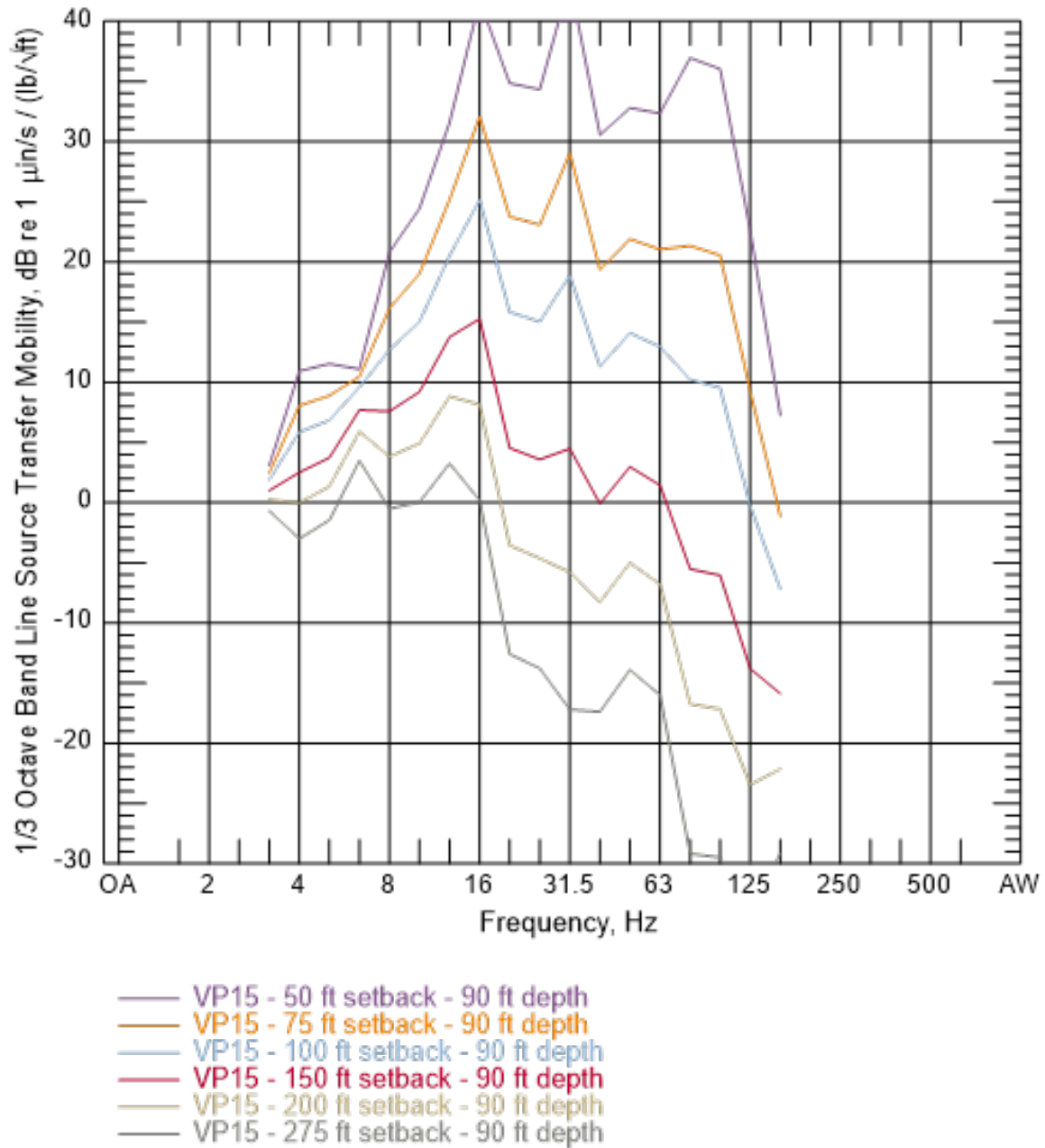


Figure C-29 Line Source Response for Borehole Impact Site VP15—90 ft Depth

Table C-30 Line Source Response Coefficients for Borehole Impact Site VP15—100 ft Depth

| Frequency (Hz) | A | B | C |
|----------------|-------|-------|-------|
| 3.15 | 13.1 | 2.2 | -4.6 |
| 4 | 34.9 | -5.2 | -4.5 |
| 5 | 6.0 | 16.0 | -7.5 |
| 6.3 | 14.6 | 6.2 | -4.2 |
| 8 | 15.9 | 5.9 | -4.2 |
| 10 | 64.9 | -17.1 | -4.1 |
| 12.5 | 90.8 | -28.0 | -3.5 |
| 16 | 24.4 | 50.0 | -25.4 |
| 20 | 120.2 | -47.6 | -2.6 |
| 25 | 141.3 | -57.4 | -2.2 |
| 31.5 | 181.0 | -79.3 | -1.4 |
| 40 | 159.9 | -71.2 | -1.7 |
| 50 | 116.2 | -49.0 | -2.5 |
| 63 | 106.3 | -44.2 | -2.7 |
| 80 | 139.9 | -63.3 | -2.0 |
| 100 | 147.9 | -68.9 | -1.8 |
| 125 | 117.2 | -55.8 | -2.2 |

Hz = hertz

$$LSR(d) = A + B * \text{Log}(d) + C * \text{Log}^2(d)$$

Where: A, B, C = Polynomial coefficients

d = Perpendicular and horizontal distance from track centerline (feet)

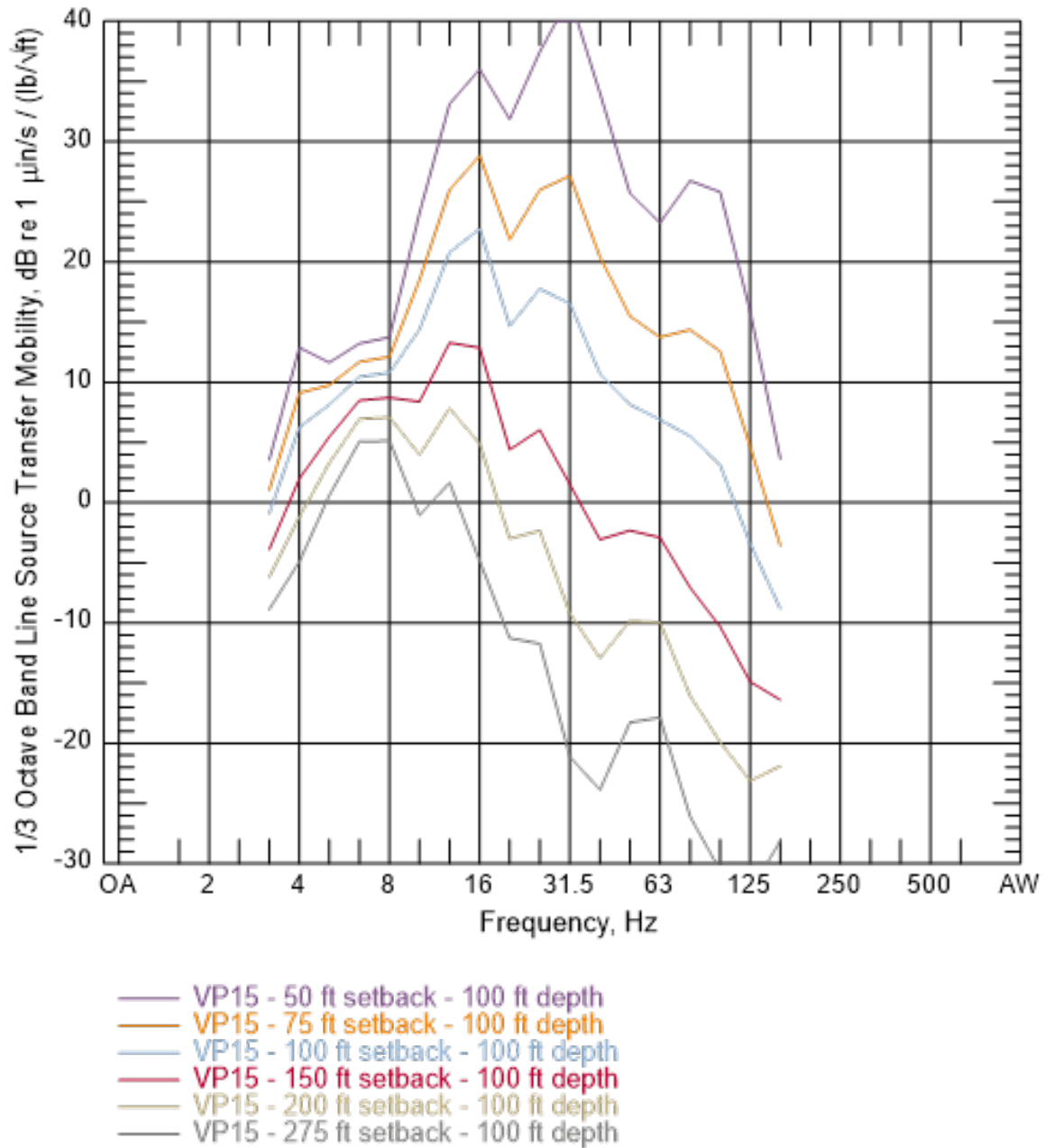


Figure C-30 Line Source Response for Borehole Impact Site VP15—100 ft Depth

Table C-31 Line Source Response Coefficients for Borehole Impact Site VP15—110 ft Depth

| Frequency (Hz) | A | B | C |
|----------------|--------|-------|-------|
| 3.15 | 5.8 | 6.6 | -4.2 |
| 4 | 26.1 | -0.5 | -4.8 |
| 5 | -275.6 | 282.5 | -70.0 |
| 6.3 | 33.1 | -1.2 | -4.8 |
| 8 | 53.7 | -10.9 | -4.5 |
| 10 | -190.2 | 214.5 | -56.1 |
| 12.5 | 86.2 | -25.8 | -3.8 |
| 16 | 110.6 | -38.8 | -3.2 |
| 20 | 127.7 | -49.5 | -2.7 |
| 25 | 133.4 | -52.1 | -2.6 |
| 31.5 | 163.5 | -69.7 | -1.9 |
| 40 | 167.0 | -73.0 | -1.8 |
| 50 | -289.8 | 323.5 | -87.1 |
| 63 | 51.5 | 1.2 | -11.6 |
| 80 | 147.6 | -66.1 | -2.0 |
| 100 | 182.8 | -85.4 | -1.4 |
| 125 | 201.3 | -97.4 | -1.1 |

Hz = hertz

$$LSR(d) = A + B * \text{Log}(d) + C * \text{Log}^2(d)$$

Where: A, B, C = Polynomial coefficients

d = Perpendicular and horizontal distance from track centerline (feet)

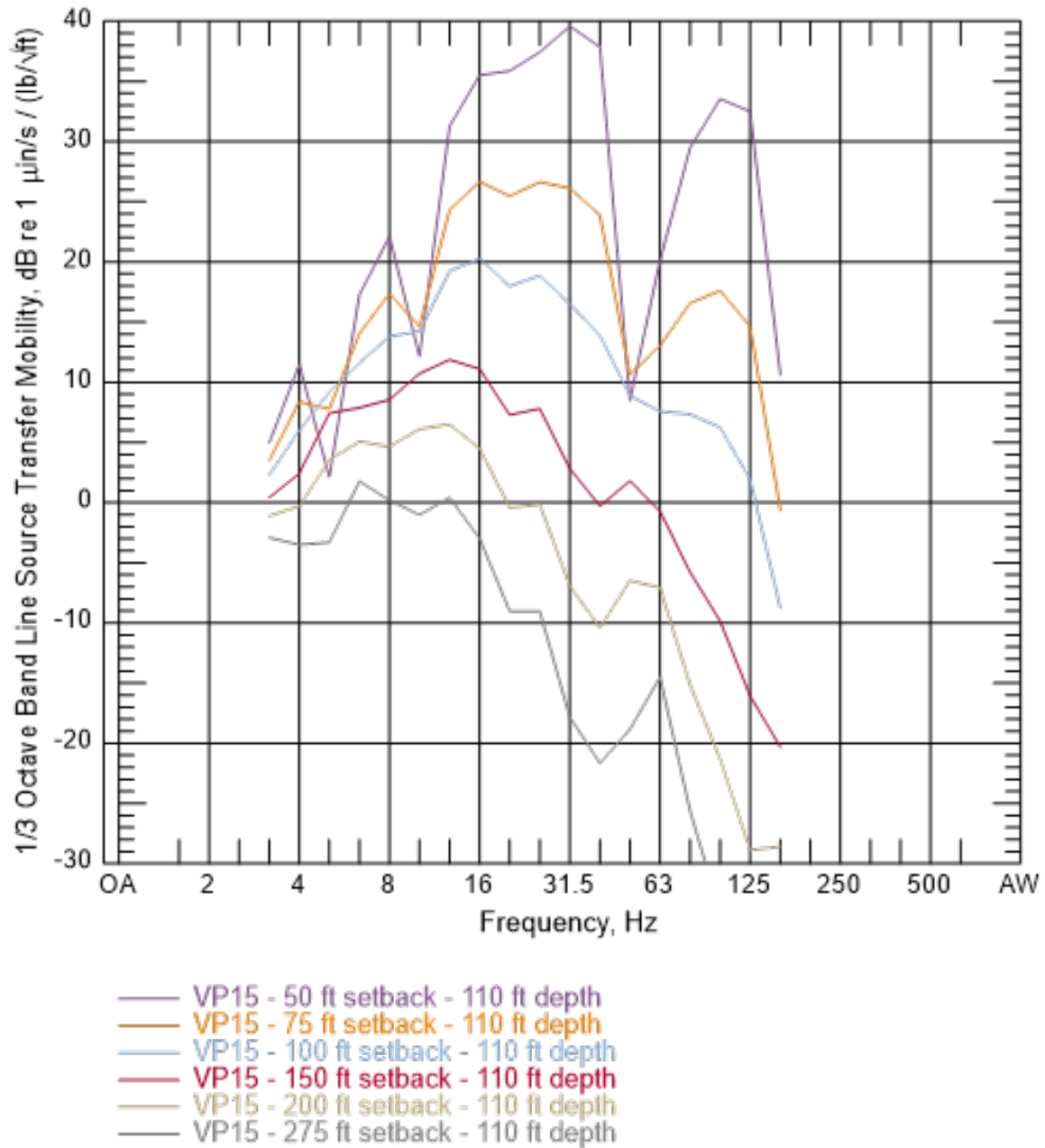


Figure C-31 Line Source Response for Borehole Impact Site VP15—110 ft Depth

Table C-32 Line Source Response Coefficients for Surface Impact Site VP16

| Frequency (Hz) | A | B | C |
|----------------|-------|-------|---|
| 3.15 | 12.5 | -3.2 | 0 |
| 4 | 20.2 | -5.3 | 0 |
| 5 | 33.1 | -10.1 | 0 |
| 6.3 | 38.5 | -11.1 | 0 |
| 8 | 40.5 | -10.1 | 0 |
| 10 | 42.3 | -9.3 | 0 |
| 12.5 | 49.4 | -12.5 | 0 |
| 16 | 56.5 | -16.2 | 0 |
| 20 | 65.2 | -20.8 | 0 |
| 25 | 69.0 | -22.6 | 0 |
| 31.5 | 86.3 | -32.7 | 0 |
| 40 | 101.8 | -43.4 | 0 |
| 50 | 101.4 | -47.2 | 0 |
| 63 | 99.4 | -50.4 | 0 |
| 80 | 89.1 | -47.7 | 0 |
| 100 | 65.0 | -36.9 | 0 |
| 125 | 35.8 | -21.9 | 0 |

Hz = hertz

$$LSR(d) = A + B * \text{Log}(d) + C * \text{Log}^2(d)$$

Where: A, B, C = Polynomial coefficients

d = Perpendicular and horizontal distance from track centerline (feet)

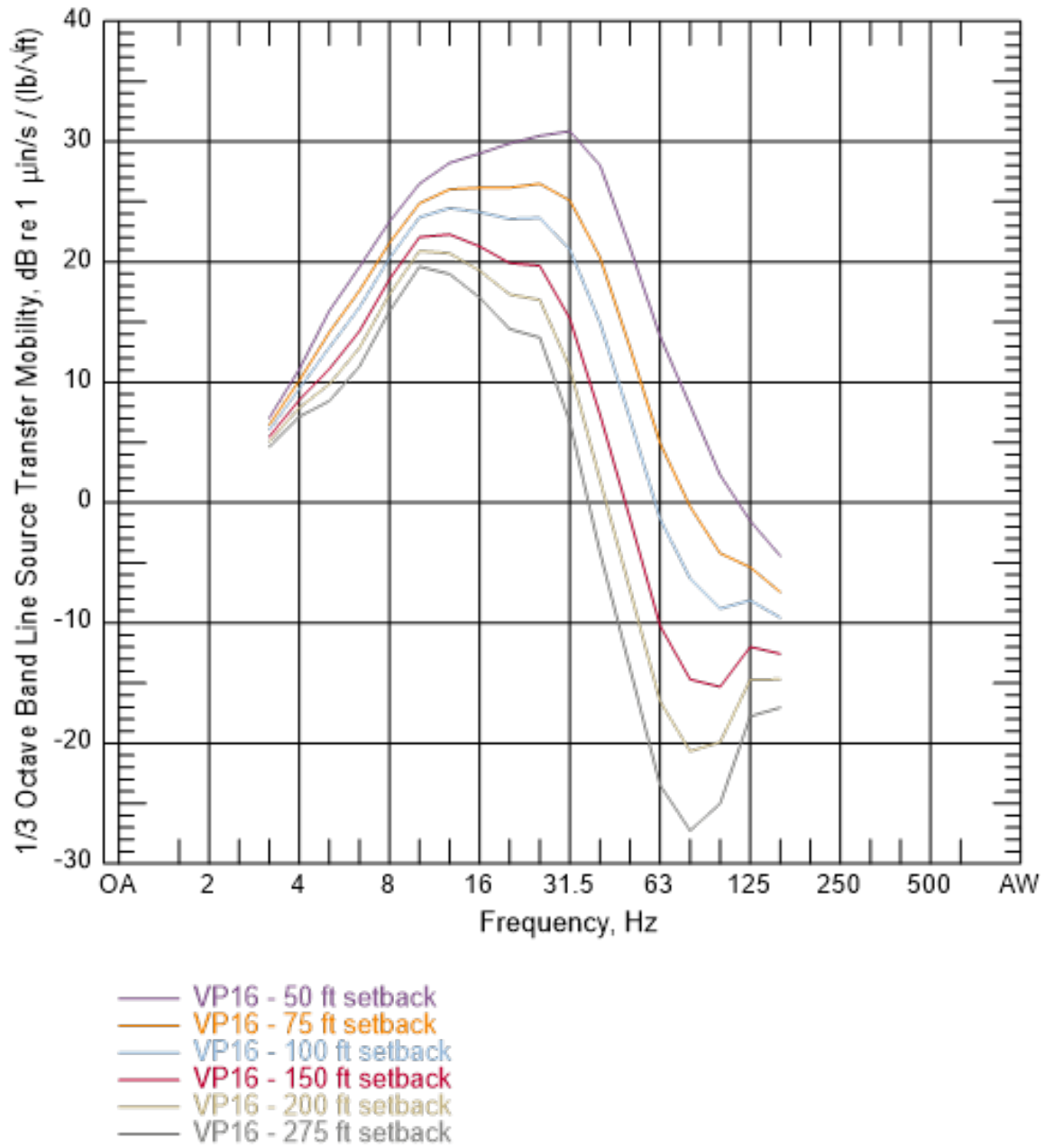


Figure C-32 Line Source Response for Surface Impact Site VP16

Table C-33 Line Source Response Coefficients for Surface Impact Site VP17

| Frequency (Hz) | A | B | C |
|----------------|------|-------|---|
| 3.15 | 25.8 | -11.3 | 0 |
| 4 | 24.9 | -8.7 | 0 |
| 5 | 26.2 | -7.4 | 0 |
| 6.3 | 26.8 | -6.1 | 0 |
| 8 | 27.3 | -4.8 | 0 |
| 10 | 30.4 | -4.6 | 0 |
| 12.5 | 33.6 | -5.2 | 0 |
| 16 | 37.9 | -7.0 | 0 |
| 20 | 46.4 | -11.5 | 0 |
| 25 | 57.7 | -17.7 | 0 |
| 31.5 | 64.7 | -21.7 | 0 |
| 40 | 74.0 | -29.3 | 0 |
| 50 | 78.5 | -33.9 | 0 |
| 63 | 77.0 | -35.8 | 0 |
| 80 | 78.4 | -39.8 | 0 |
| 100 | 66.3 | -36.1 | 0 |
| 125 | 48.3 | -27.1 | 0 |

Hz = hertz

$$LSR(d) = A + B * \text{Log}(d) + C * \text{Log}^2(d)$$

Where: A, B, C = Polynomial coefficients

d = Perpendicular and horizontal distance from track centerline (feet)

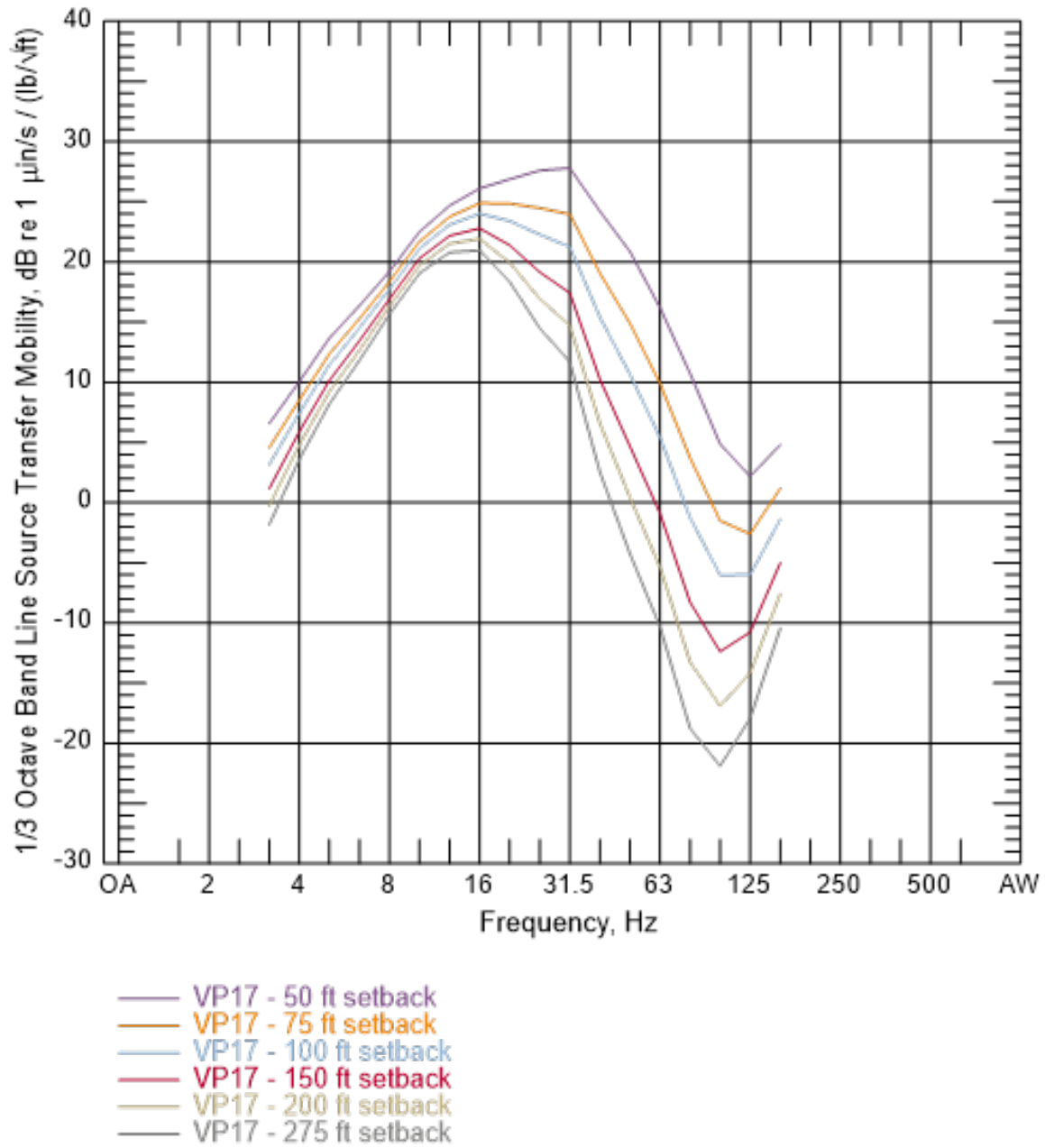


Figure C-33 Line Source Response for Surface Impact Site VP17

Table C-34 Line Source Response Coefficients for Surface Impact Site VP18

| Frequency (Hz) | A | B | C |
|----------------|-------|--------|-------|
| 3.15 | 9.7 | -1.5 | 0.0 |
| 4 | 15.6 | -0.3 | -1.0 |
| 5 | 38.7 | -17.2 | 2.3 |
| 6.3 | 31.0 | -7.4 | 0.0 |
| 8 | 33.3 | -6.5 | 0.0 |
| 10 | 42.5 | -9.1 | 0.0 |
| 12.5 | 22.6 | 19.7 | -8.7 |
| 16 | 68.3 | -20.4 | 0.0 |
| 20 | 42.4 | 13.0 | -10.3 |
| 25 | 71.7 | -13.6 | -5.0 |
| 31.5 | 47.1 | 13.7 | -13.2 |
| 40 | 83.4 | -27.5 | -3.2 |
| 50 | 119.3 | -72.3 | 8.7 |
| 63 | 140.4 | -100.3 | 15.5 |
| 80 | 134.7 | -101.5 | 16.2 |
| 100 | 95.2 | -75.9 | 11.9 |
| 125 | 23.5 | -13.8 | -0.9 |

Hz = hertz

$$LSR(d) = A + B * \text{Log}(d) + C * \text{Log}^2(d)$$

Where: A, B, C = Polynomial coefficients

d = Perpendicular and horizontal distance from track centerline (feet)

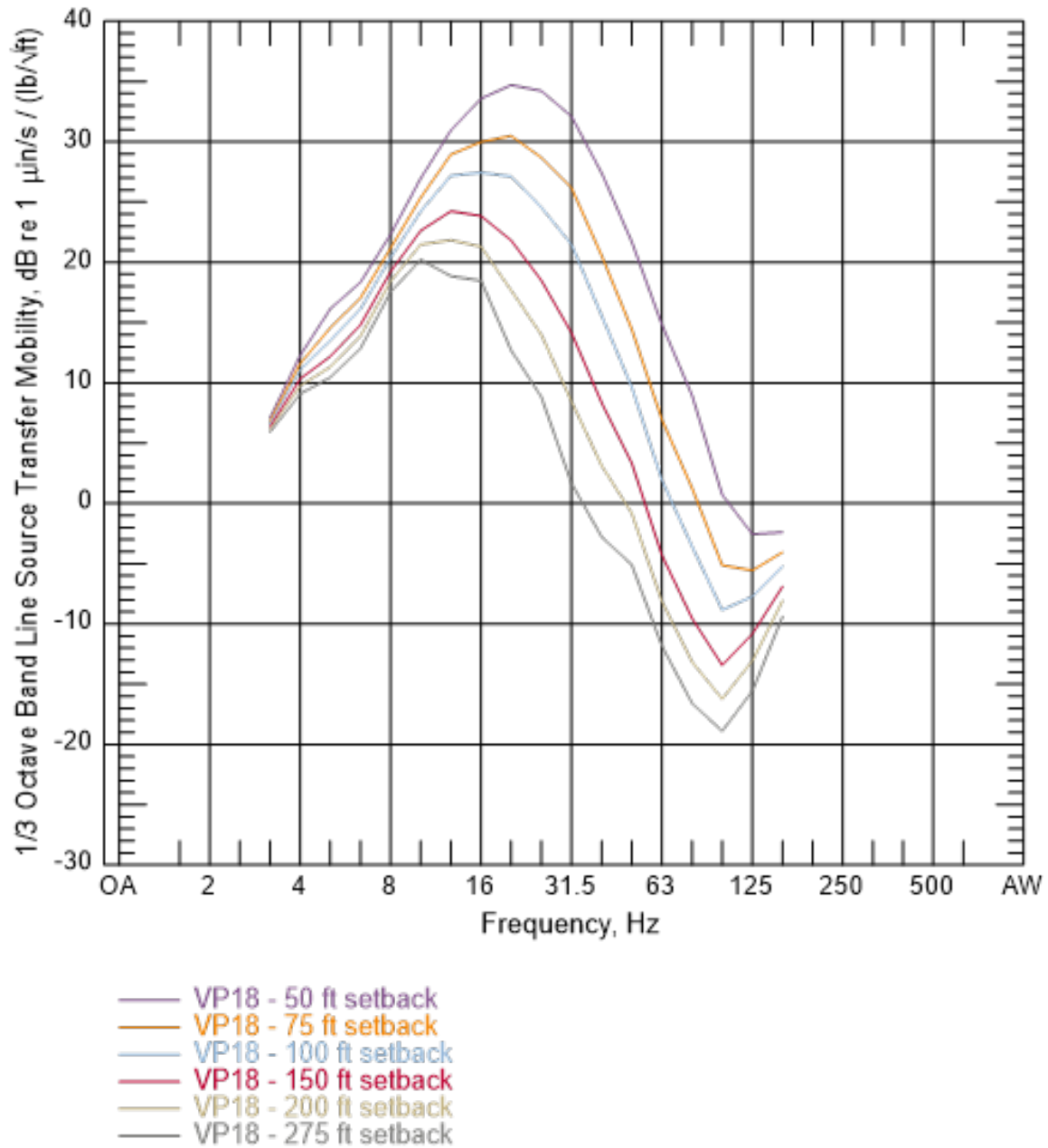


Figure C-34 Line Source Response for Surface Impact Site VP18

Table C-35 Line Source Response Coefficients for Borehole Impact Site VP19—50 ft Depth

| Frequency (Hz) | A | B | C |
|----------------|-------|-------|---|
| 3.15 | 45.6 | -19.5 | 0 |
| 4 | 38.7 | -13.8 | 0 |
| 5 | 32.4 | -7.3 | 0 |
| 6.3 | 38.7 | -9.8 | 0 |
| 8 | 58.3 | -20.2 | 0 |
| 10 | 51.8 | -17.0 | 0 |
| 12.5 | 51.6 | -16.0 | 0 |
| 16 | 41.1 | -8.4 | 0 |
| 20 | 64.1 | -20.9 | 0 |
| 25 | 107.4 | -44.0 | 0 |
| 31.5 | 143.6 | -62.7 | 0 |
| 40 | 127.3 | -55.5 | 0 |
| 50 | 108.3 | -45.5 | 0 |
| 63 | 99.9 | -43.7 | 0 |
| 80 | 123.1 | -57.4 | 0 |
| 100 | 121.9 | -57.0 | 0 |
| 125 | 115.1 | -55.1 | 0 |

Hz = hertz

$$LSR(d) = A + B * \text{Log}(d) + C * \text{Log}^2(d)$$

Where: A, B, C = Polynomial coefficients

d = Perpendicular and horizontal distance from track centerline (feet)

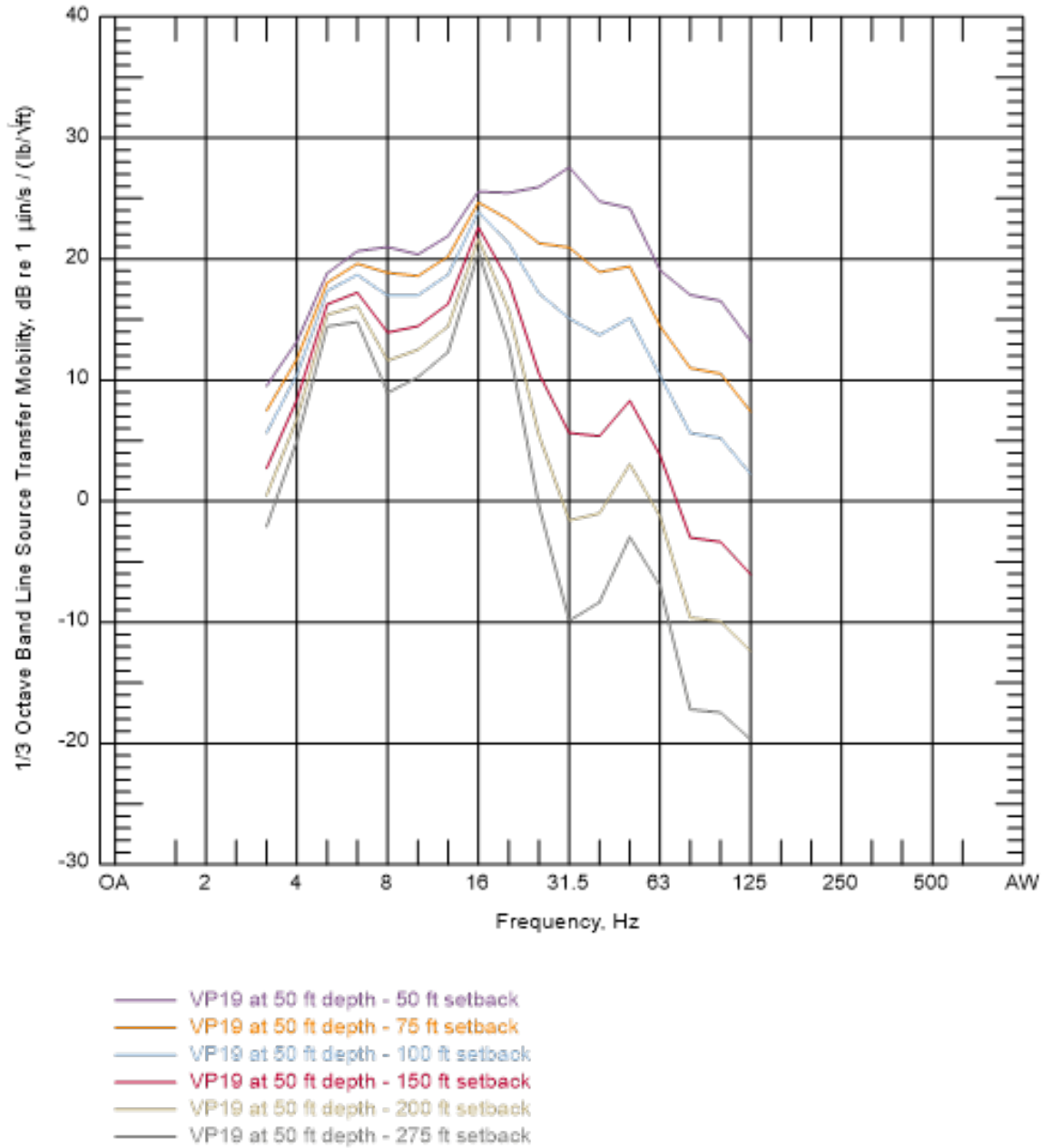


Figure C-35 Line Source Response for Borehole Impact Site VP19—50 ft Depth

Table C-36 Line Source Response Coefficients for Borehole Impact Site VP19—60 ft Depth

| Frequency (Hz) | A | B | C |
|----------------|-------|-------|---|
| 3.15 | 81.9 | -39.8 | 0 |
| 4 | 42.1 | -16.1 | 0 |
| 5 | 23.3 | -1.0 | 0 |
| 6.3 | 57.0 | -18.2 | 0 |
| 8 | 71.8 | -27.3 | 0 |
| 10 | 55.1 | -16.6 | 0 |
| 12.5 | 70.8 | -22.9 | 0 |
| 16 | 65.7 | -21.1 | 0 |
| 20 | 84.6 | -30.5 | 0 |
| 25 | 111.4 | -46.6 | 0 |
| 31.5 | 117.5 | -51.3 | 0 |
| 40 | 137.6 | -60.9 | 0 |
| 50 | 140.6 | -63.2 | 0 |
| 63 | 56.8 | -21.6 | 0 |
| 80 | 125.4 | -58.0 | 0 |
| 100 | 127.1 | -60.7 | 0 |
| 125 | 141.2 | -70.0 | 0 |

Hz = hertz

$$LSR(d) = A + B * \text{Log}(d) + C * \text{Log}^2(d)$$

Where: A, B, C = Polynomial coefficients

d = Perpendicular and horizontal distance from track centerline (feet)

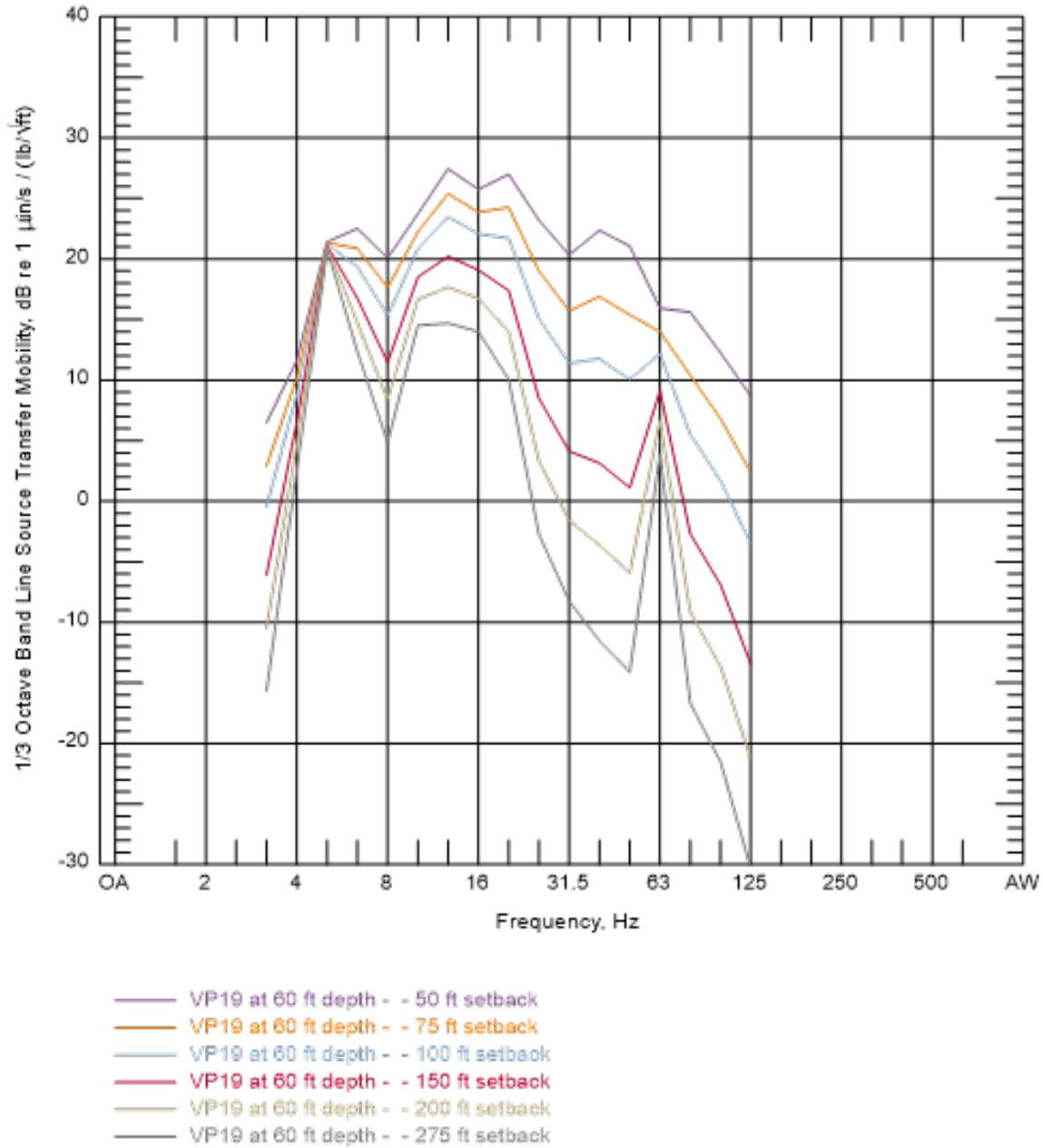


Figure C-36 Line Source Response for Borehole Impact Site VP19—60 ft Depth

Table C-37 Line Source Response Coefficients for Borehole Impact Site VP19—71 ft Depth

| Frequency (Hz) | A | B | C |
|----------------|-------|-------|---|
| 3.15 | 15.3 | -4.2 | 0 |
| 4 | 12.6 | -0.9 | 0 |
| 5 | 14.5 | -0.1 | 0 |
| 6.3 | 17.6 | -0.4 | 0 |
| 8 | 85.0 | -35.8 | 0 |
| 10 | 51.1 | -17.8 | 0 |
| 12.5 | 37.3 | -10.2 | 0 |
| 16 | 50.3 | -14.7 | 0 |
| 20 | 104.9 | -41.4 | 0 |
| 25 | 134.3 | -56.4 | 0 |
| 31.5 | 151.3 | -65.9 | 0 |
| 40 | 125.6 | -54.5 | 0 |
| 50 | 135.2 | -59.9 | 0 |
| 63 | 157.5 | -72.4 | 0 |
| 80 | 157.5 | -75.1 | 0 |
| 100 | 127.1 | -64.6 | 0 |
| 125 | 123.7 | -64.5 | 0 |

Hz = hertz

$$LSR(d) = A + B * \text{Log}(d) + C * \text{Log}^2(d)$$

Where: A, B, C = Polynomial coefficients

d = Perpendicular and horizontal distance from track centerline (feet)

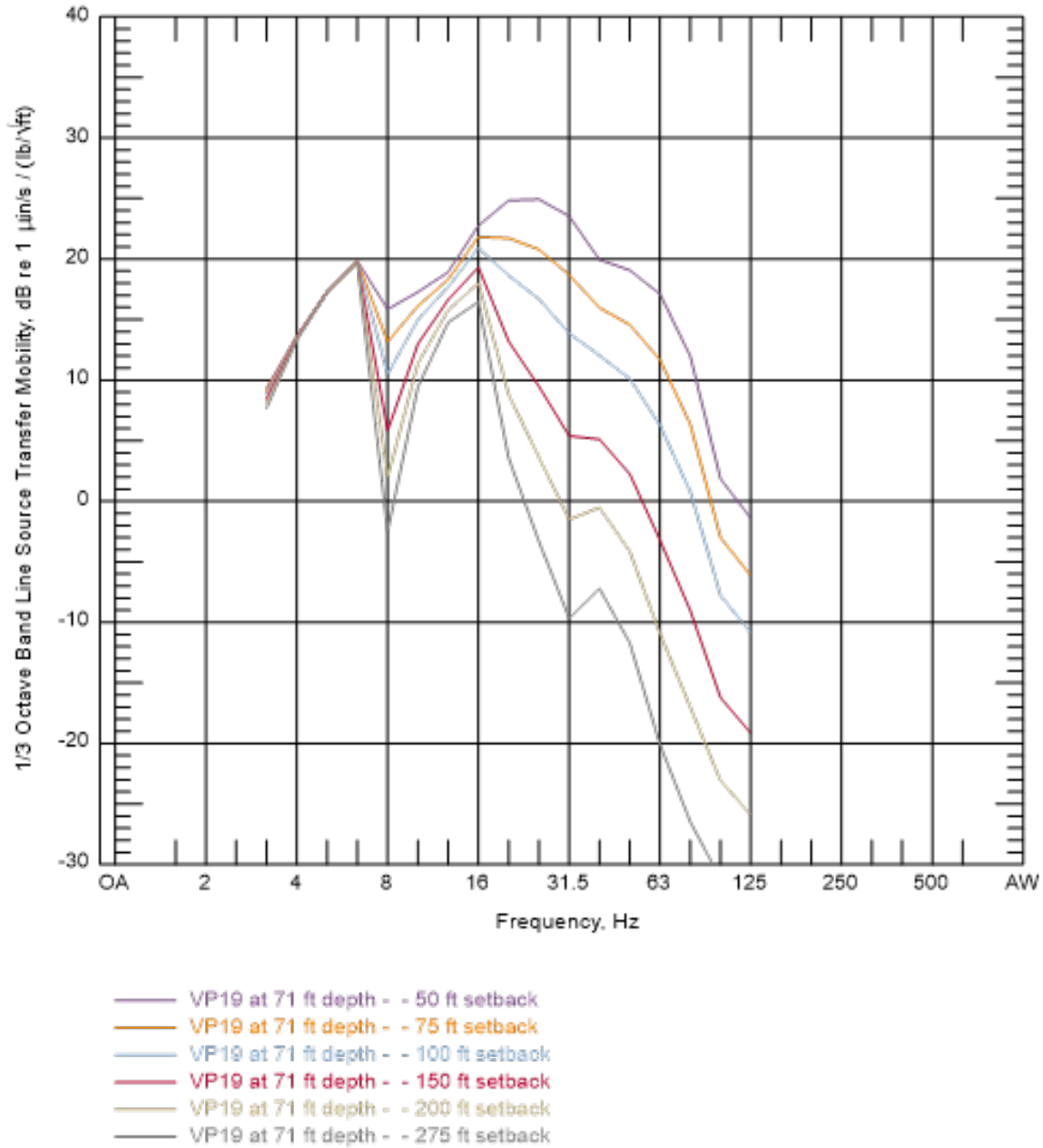


Figure C-37 Line Source Response for Borehole Impact Site VP19—71 ft Depth

Table C-38 Line Source Response Coefficients for Surface Impact Site VP20

| Frequency (Hz) | A | B | C |
|----------------|------|-------|---|
| 3.15 | 24.0 | -3.1 | 0 |
| 4 | 29.6 | -4.7 | 0 |
| 5 | 44.2 | -10.2 | 0 |
| 6.3 | 48.2 | -10.3 | 0 |
| 8 | 49.2 | -9.7 | 0 |
| 10 | 53.6 | -11.3 | 0 |
| 12.5 | 58.2 | -13.7 | 0 |
| 16 | 63.5 | -16.8 | 0 |
| 20 | 69.3 | -19.6 | 0 |
| 25 | 76.0 | -22.9 | 0 |
| 31.5 | 82.8 | -26.9 | 0 |
| 40 | 78.8 | -28.2 | 0 |
| 50 | 79.9 | -33.3 | 0 |
| 63 | 67.3 | -30.5 | 0 |
| 80 | 64.4 | -32.8 | 0 |
| 100 | 60.4 | -34.2 | 0 |
| 125 | 46.9 | -28.1 | 0 |

Hz = hertz

$$LSR(d) = A + B * \text{Log}(d) + C * \text{Log}^2(d)$$

Where: A, B, C = Polynomial coefficients

d = Perpendicular and horizontal distance from track centerline (feet)

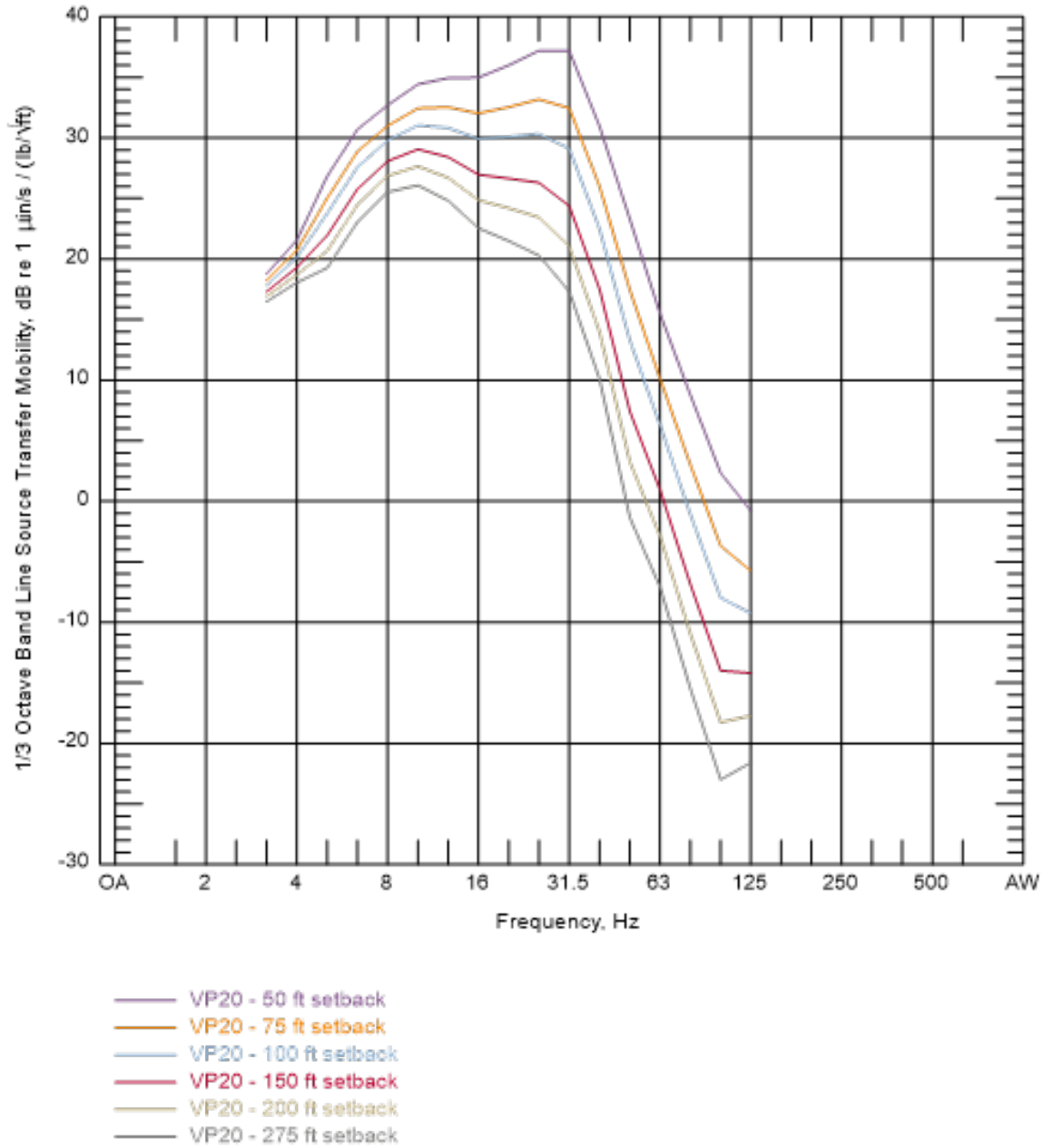


Figure C-38 Line Source Response for Surface Impact Site VP20